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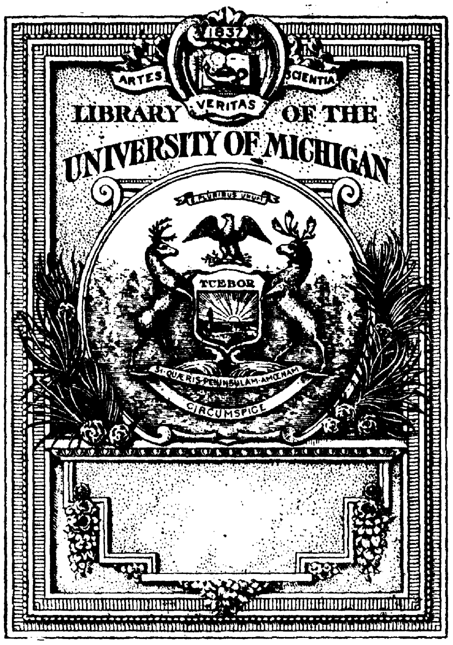
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VOL. II—NO. 3

The Ancient Hawaiian House

BY WILLIAM T. BRIGHAM, A.M., Sc.D. (Columbia)

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THE ANCIENT HAWAIIAN HOUSE.

Housebuilding of the old Hawaiians: with a description of the articles used in housekeeping. By WILLIAM T. BRIGHAM, SC. D. (COLUMBIA), *Director of the Bernice Pauahi Bishop Museum.*

IN pursuance of my intention to describe, so far as known to me, the life, manners and customs of the ancient Hawaiians, I have described the feather ornaments, stone implements, and mat and basket work, and now come to the dwellings of the early inhabitants of the Hawaiian Group: and in considering this exceeding important matter of aboriginal life I propose to glance briefly at the primitive habitations of some of the other Polynesian groups and of their neighbors of the Papuan and mixed races. While this course will take us from Rapanui in the East of the Pacific Ocean to New Guinea in the West, I will limit my descriptions (where they are not limited by my ignorance of the subject) and illustrations as much as possible to the material which seems in some degree to illuminate the main subject of *Hawaiian* housebuilding.

To the empty dwelling I have found it convenient to add the usual furniture and utensils which are a necessary part of housekeeping, and although "pots and kettles" are absent, Polynesians having neither metal nor earthen ware, we shall find the better class of Hawaiians were provided with many articles of necessity, even of luxury and elegance, although it will be seen that the common people, the *makaainana*, had little furniture for comfort, and only the merest necessities for housekeeping.

Illustrations have been drawn from the early voyages and, where fashions have not changed by the coming of white settlers, from my large collection of photographs of existing dwellings from nearly every part of the Pacific that the photographer has invaded.

PRIMITIVE architecture may be studied in the Pacific region (where the indigenous architecture has always remained primitive), from the habitations of the troglodytes, where man's hand has hardly modified the natural cavities of the rock formation, through the exceeding simple bark lean-to of the Australian, the cyclopean structures of the Metalanim in the Carolines, the imbedded stone cells of Rapanui, the columned halls of Tinian in the Marianes, the trilithon of Tonga, the elaborately carved *whare* of New Zealand, and the ephemeral houses of sticks and grass, plain as possible in the Hawaiian group, picturesque in parts of Micronesia and fantastic in New Guinea.

The temptation is strong to explore and study more fully the curious stone remains found in many places in the Pacific from Rapanui in the southeast to Tinian in the northwest, and although the evidence that these were the work of the ancestors of the races at present found in the great ocean seems preponderant, they need claim only a passing glance here for they, together with the stone temples of Hawaii, belong to religious or monumental constructions, and we are to limit this excursus to those materials that may be explanatory of the origin or affinity of the Hawaiian dwelling.

In Central America we find wonderful structures of stone buried in forests almost as dense as the veil which shrouds their origin or uses, but we recognize that the houses of the people who built and used these temples, palaces, monasteries or charnel houses, and who must have dwelt in the neighborhood, were constructed of more perishable material and have left no record. In Egypt the same is true; the houses of the gods and of the dead are of durable masonry and material, syenite, limestone, alabaster, while the houses of the people, even the palaces of the Pharaohs were flimsily constructed of wood and have perished save in the pictured stories on the walls of the tombs. The American record in the wonderful painted books which doubtless would have given much light on Maya domestic architecture was mostly destroyed by the fanatic priests who swarmed in the invading armies,—deadly foes to knowledge,—may their souls repent the evil they did! Everywhere the same thing is true of domestic architecture in primitive times and in lands with a mild climate; if the people did not dwell in tents they certainly had houses of not much greater durability.

In the Pacific we still have "samples" of the houses which probably have not changed much from the earliest times, but the lumber and building methods of the foreigner are rapidly driving out even these samples from those groups most open to outside influence. On the Hawaiian Islands forty years ago grass houses were very common outside the larger towns, and even in Honolulu they were found on some of the principal streets. In this town in 1837 they were almost universal as seen in a view of Honolulu drawn by the late Edward Bailey from the foot of Punchbowl Hill and engraved at Lahainaluna under the instruction of Judge Lorin Andrews (Fig. 1). Today we have had to gather into the Bishop Museum an ancient house frame, and the tourist may make the usual circuit of the group and never see an example of a genuine Hawaiian house, although in several places Japanese have built grass houses resembling the native work externally.

The boards and plans of the foreigner result in a cheaper, more convenint, and more durable house than those of the olden style, so the latter are passing and it seems desirable to make a record of their existence and nature, and at the same time compare them with other dwellings in our region. No limitation can be made to the strictly Polynesian tribes, for there is more difference between the Maori and Hawaiian houses, both Polynesian, than between the Hawaiian and the New Caledonian, the latter the work of a very different race. It will then be desirable, if not needful, to present to the readers of this essay types of the principal forms of dwelling houses of the Pacific islanders before entering upon the structure, uses and situation of the Hawaiian houses.

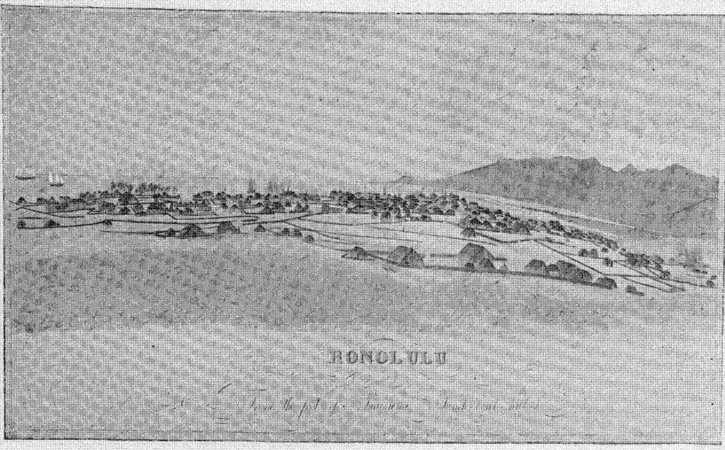

FIG. I. VIEW OF HONOLULU IN 1837.

Even where the material is the same, sticks and thatch, the ground plan varies between island groups while on each group one form is predominant if not exclusive. Thus on Hawaii, Fiji, Tahiti, New Zealand and New Guinea a rectangular plan prevailed, on Samoa and Tonga the ellipse and in New Caledonia the circle were preferred. The Hawaiians certainly built temples with a circular ground plan, but so far as can be learned never a dwelling house. Single habitations were more common in the East, communal in the West of the Pacific region, yet in Hawaii the hospitality of the people made their private home almost a caravansary. In some groups, as in Hawaii, an establishment of a chief or well-to-do man consisted of several detached houses each for an especial use; in others there were houses (or cages) for girls of marriageable age; in others guest houses; and common to many groups were the lodging houses for unmarried males.

The material for a study of the oldest habitations of the Pacific immigrants must be gathered from the accounts, sometimes excellent, of the old voyagers and in these we shall find little change through the century these voyages practically cover, for the early Spanish and Portuguese explorers have not given sufficiently definite descriptions of the houses of the people they discovered. As the good descriptions of houses are scattered through accounts of voyages not always accessible, it seems well to transcribe them here with such illustrations as the authors have given us. In some cases, as in the accounts of the Marquesan houses it would seem possible to reconstruct the homes of the fine natives who have long since disappeared from the beautiful valleys where they once thronged to their cannibal feasts.

In the voyage of the Duff,[1] the first missionary expedition to the Pacific from England, are given detailed accounts of the houses in Tahiti, Tonga and the Marquesas which will be here reproduced from that very interesting volume. On page 131 we find this account of a Marquesan house on the island of Santa Cristina (Tahuata):

> To convey an idea of what this and all their best built houses are like, it is only necessary to imagine one of our own of one story high with a high peaked roof; cut it lengthwise exactly down the middle, you would then have two of their houses, only built of different materials. That we now occupied was twenty-five feet long and six wide, ten feet high in the back part, and but four in front; at the corners four short stakes are driven into the earth, on which are laid horizontal pieces, and from these last to the ground are bamboos neatly arranged in perpendicular order, about half an inch distant from each other; and without them long blinds made with leaves are hung, which make the inside very close and warm; the door is about the middle on the low side. They do not use the leaves of the wharra [Pandanus] tree here for roofing, as at Otaheite, but common broad leaves which they lay as thick as to keep the water out; but the greater part of their houses are miserable hovels. The inside furniture consisted of a large floor mat from end to end, several large calabashes, some fishing tackle, and a few spears; at one end the chief kept his ornaments which he showed to us.

A generation later the Marquesans were visited by a more observant missionary whose account of the houses, while showing that the style remained the same, leaves little to be desired. The Rev. C. S. Stewart, well known on these islands, wrote as follows:

> The houses—though of very different sizes, from twenty to one hundred feet in length, from eight to sixteen in height, and from ten to fourteen and sixteen in breadth—are all of one shape and style, and vary materially in their form and construction from those of the Sandwich Islanders.
>
> Here the roofs, instead of descending to eaves on both sides of the ridgepole, have rafters in front only, while the back of the house descends perpendicularly, or in very slight inclination, from the peak to the ground—giving to the exterior the appearance of an ordinary hut cut lengthwise in two. They are universally erected, so far as I have observed, on a platform of rough, but in many

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[1] A Missionary Voyage to the Southern Pacific Ocean, performed in the years 1796-1798 in the Ship Duff commanded by Captain James Wilson. Compiled from Journals of the Officers and the Missionaries; and illustrated with Maps, Charts, and Views drawn by Mr. William Wilson and engraved by the most eminent Artists, etc. London, 1799.

cases massive stone-work, from one to four feet in height, which extends two or three feet beyond the area of the house. The rafters descend in front to a plate or timber extending the whole length of the house, supported by a row of thick round pillars, from three to five feet in height, over which the eaves project sufficiently to screen the entrance from the weather.

At the peak the rafters rest on a similar stick of timber, supported by two or more posts, from eight to fourteen feet in height. The space between them is filled with poles of bamboo, or of the light wood of the hibiscus, laid parallel, two or three inches apart over which lighter sticks are placed horizontally, at regular intervals; the whole being neatly lashed together at the points of intersection.

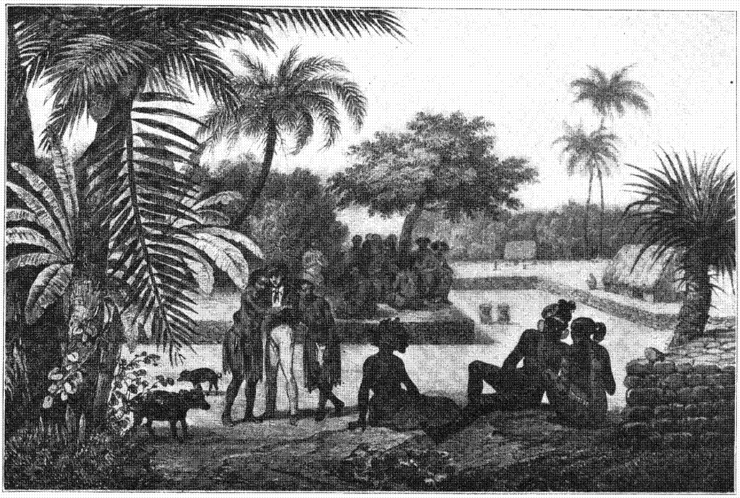

FIG. 2. MARQUESAN VILLAGE (FROM VOYAGE OF THE VENUS, PL. 20).

The back and ends are filled up in the same manner, and thus prepared for the external covering. This is of thatch composed either of the leaf of the breadfruit tree, the cocoanut, or palmetto, *Chamærops humilis* [*Pritchardia pacifica*]—all of which are prepared for this purpose in different methods. The cocoanut leaf is from twelve to sixteen feet long and deeply feathered on either side of the rib running through the middle of it. This rib or stem is split from end to end, and the leaflets on each braided closely together, forming a matting of that length, and one and a half or two feet in breadth. Thus prepared, they are placed on the rafters double, the higher ranges lapping over the lower in the manner of slates or shingles.

The leaf of the breadfruit is two feet in length, one and more in width, and deeply indented. It is prepared for thatching by stringing the leaves as closely as possible upon a rod of light wood, ten or twelve feet long and half an inch in diameter, through a slit made in the stem of each leaf; it is then attached to the roof and sides in the same manner as the cocoanut, and forms a more durable and better thatch.

But the palmetto affords the most valued covering, and that most used—especially for the roof—wherever found in sufficient abundance. Its fan-like leaves are fastened one by one, with their centres about a foot from each other, upon long, split pieces of the hibiscus, which are then ranged upon the roof, sixteen or eighteen inches apart, and, thus disposed, lap considerably every way, over each other. All these kinds of thatch, instead of becoming dark and sunburnt, like the grass of the Sandwich Islands huts, bleach beautifully; and when seen at a distance, gleam among the groves, in the brightness of the day, like neatly whitened cottages in our own country.

The fronts of the habitations are seldom thatched. Sometimes they are entirely open; in which case the timber supporting the roof, and the pillars beneath, are generally neatly hewn and ornamented by braids of sennit of various colors, white, black, yellow, etc., tied on in horizontal stripes, in diamonds or in checks, in a pretty and fanciful manner. In most of the houses, however, the front is composed of bamboos, lashed horizontally to the pillars, at intervals of an inch or two, or in lattice-work, for the admission of light; in which case there is a small door in the middle, furnished with a shutter, in a slide, to be closed or opened at pleasure.

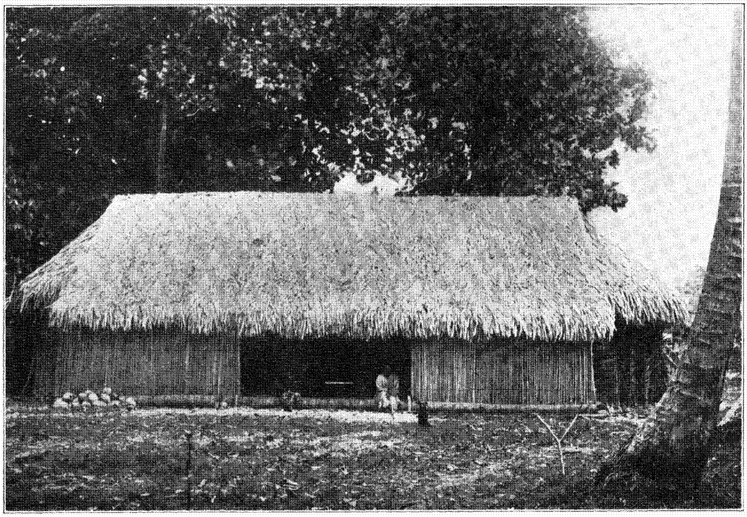

FIG. 3. TAHITIAN QUEEN'S HOUSE.

In every house the internal arrangement is the same. A smooth trunk of a cocoanut tree extends the whole length, a foot or two from the farther side. At an interval of about four feet another lies parallel to it; and the space between, spread with grass and covered with mats, constitutes the bed of the whole family and household—the innermost log forming a general pillow, and the second a support for the lower limbs, which extend over it. The rest of the area is a paved floor—a foot or two above the platform without—upon which they partake of their meals and perform their indoor work.

Calabashes of food and water—wooden bowls and trays—some stone adzes with other rude implements—numerous spears and war-clubs—and a few muskets sticking in the thatch—constituted the furniture of the establishment.[2]

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[2] Charles S. Stewart.—A Visit to the South Seas in 1829-30. New York, 1831. I, p. 233.

Now Cook speaks of the Marquesan houses that he saw at Tahuata (Santa Cristina of his voyage) in by no means so eulogistic tone. He says:[3]

> Their dwellings are in the vallies and on the sides of the hills, near their plantations. They are built after the same manner as at Otaheite; but are much meaner, and only covered with the leaves of the bread tree. The most of them are built on a square, or oblong, pavement of stone raised some height above the level of the ground. They likewise have such pavements near their houses, on which they sit to eat and amuse themselves.

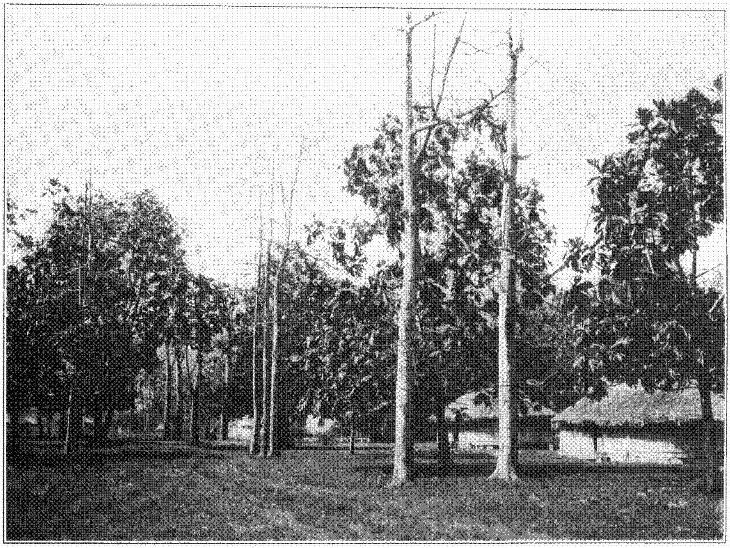

FIG. 4. TAHITIAN VILLAGE.

Not a word about the most marked peculiarity of the last description—the halved form shown in Fig. 2. The platforms are also shown in that figure. This is the more remarkable as Cook was usually quick to notice any strange thing, and this manner of building he found nowhere else in the Pacific.

Society Islands, Tahiti.—From the savage tempered and warlike Marquesan we turn to the indolent, pleasure loving Tahitian. The one a cannibal, the other loving his fellows in a different way. Cook had more time to study the Tahitians, and he certainly gives us a pleasant picture:[4]

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[3] Cook, Second Voyage. I, p. 310.
[4] Cook, Journal (printed verbatim), July, 1769, p. 96.

The Houses or dwellings of these People are admirably calculated for the continual warmth of the Climate; they do not build them in Towns or Villages, but seperate each from the other, and always in the Woods, and are without walls, so that the air, cooled by the shade of the Trees, has free access in whatever direction it happens to blow. No country can boast of more delightful walks than this; the whole Plains where the natives reside are covered with groves of Bread Fruit and Cocoa Nut Trees, without underwood, and intersected in all directions by the Paths which go from House to House, so that nothing can be more grateful in a Climate where the sun hath so powerful an influence. They are generally built in form of an Oblong square, the Roofs are supported by 3 Rows of Pillars or Posts, and neatly covered with Thatch made of Palm leaves. A middle-siz'd house is about 24 ft. by 12, extream heigth about 8 or 9, and heigth of the Eves 3½ or 4. The floors are cover'd some inches deep with Hay, upon which, here and there, lay matts for the convenience of sitting down; few houses has more than one Stool, which is used only by the Master of the family. [See Fig. 8.]

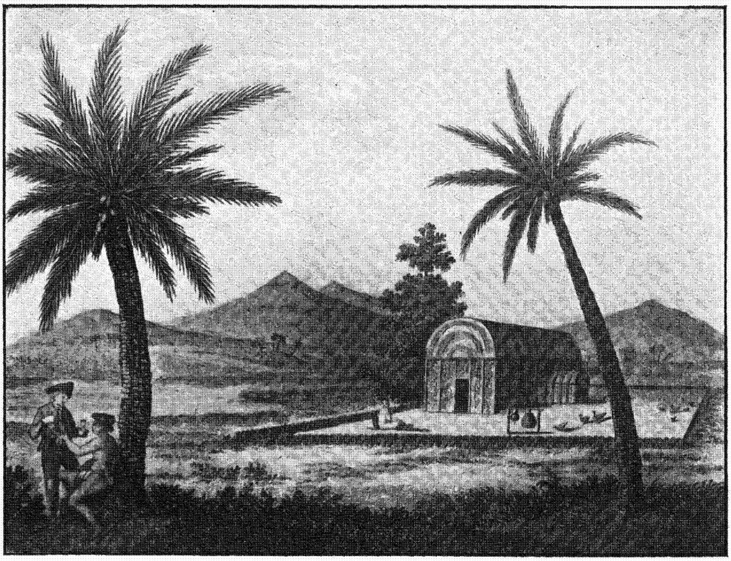

FIG. 5. TAHITIAN CHIEF'S HOUSE.[5]

In their houses are no rooms or Partitions, but they all huddle and Sleep together; yet in this they generally observe some order, the Married people laying by themselves, and the unmarried each sex by themselves, at some distance from each other. Many of the *Eares* or Chiefs are more private, having small movable houses in which they Sleep, man and Wife, which, when they go by Water from place to place, are tied upon their canoes; these have walls made of Cocoa-Nut leaves, etc. I have said that the houses are without walls, but this is only to be understood in general, for many of them are walled with wickering but not so close but to admit a free circulation of Air. The matts which serve them to sit upon in the daytime are also their beds in the night, and the Cloathes they wear in the day serve for covering, a little wood Stool, block of wood, or bundle of Cloth for a Pillow. Besides these common houses there are others much larger, 200 feet long and upwards, 30 broad, and 20 in heigth. There are generally two or three of these in every district, and seem'd not only built for the accommodation of the principal people, but common to all the inhabitants of that district, and raised and kept up by their joint labour; these are always without walls, and have generally a large Area on one side neatly enclosed with low pallisades, etc.

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[5] Plate VI of Parkinson's Journal.

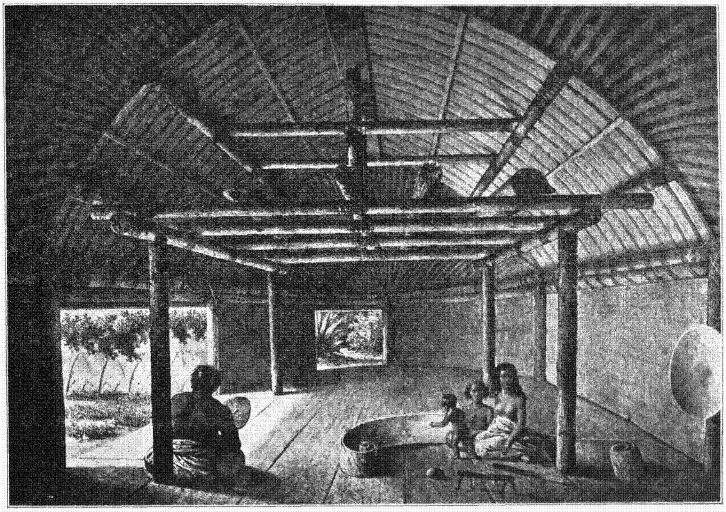

FIG. 6. TONGAN INTERIOR (VOYAGE DE L'ASTROLABE, PL. 75).

With Cook was the young artist Parkinson (who did not live to complete the voyage), and he gives us a picture of the house of a Tahitian chief which is so remarkable a deviation from Polynesian domestic architecture that, were it not for his accuracy of draughtmanship in other things, might be treated as a creature of his imagination. He gives no description but the view shows clearly the outside of a high house with a barrel-vaulted roof.[6] The framing seems to be on the outside and the thatch within. The "Area on one side" which Cook mentions is clearly shown (Fig. 5).

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[6] Parkinson says in a note: Taotahau's house is one hundred and twenty yards long, and twenty yards broad: the roof is supported by twenty posts each nineteen feet high." Parkinson's Journal, p. 55.

Tongan Houses.—Abel Tasman, the discoverer of the Tongan Group which the next visitor, Cook, called Friendly Islands, gives us no description of the houses on this cluster of comparatively low islands, and we must look to Cook for the needed information. Now the Tongans are peculiarly situated, for while the racial affinities are all with the Tahitians, their commercial dealings were chiefly with the Fijians, a race usually considered a cross between the Polynesian and some darker strain, whether Melanesian or Papuan. Hence it is interesting to find what we can of their dwellings. We must begin with Cook. Speaking of the houses on Namuka he says:[7]

> Some here differ from those I saw at the other isles; being inclosed or walled on every side with reeds neatly put together but not close. The entrance is by a square hole about two and a half feet each way. The form of these houses is an oblong square; the floor or foundation every way shorter than the eve, which is about four feet from the ground. By this construction, the rain that falls on the roof, is carried off from the wall; which otherwise would decay and rot.

On his third and last voyage (1784) Cook again saw the Tongan group and he gives us his final impressions. Probably with his seamanship he disapproved of so many bare spars in the interior of the Tongan house, although he admits they are judiciously arranged:[8]

> It is remarkable that these people, who, in many things, shew much taste and ingenuity, should shew little of either in building their houses; though the defect is rather in the design, than in the execution. Those of the lower people are poor huts, scarcely sufficient to defend them from the weather, and very small. Those of the better sort are larger and more comfortable; but not what we might expect. The dimensions of one of a middling size, are about thirty feet long, twenty broad, and twelve high. Their house is, properly speaking, a thatched roof or shed, supported by posts and rafters, disposed in a very judicious manner. The floor is raised with earth smoothed, and covered with strong, thick matting, and kept very clean. The most of them are closed on the weather side (and sometimes more than two thirds round), with strong mats, or with branches of the cocoa-nut tree, plaited or woven with each other. These they fix up edgewise, reaching from the eaves to the ground; and thus they answer the purpose of a wall. A thick strong mat, about two and one half or three feet broad, bent into the form of a semicircle, and set upon its edge, with the ends touching the side of the house, in shape resembling the fender of a fire hearth, incloses a space for the master and mistress of the family to sleep in. * * * * * The rest of the family sleep upon the floor, wherever they please to lie down, the unmarried men and women apart from each other. Or, if the family be large, there are small huts adjoining, to which the servants retire in the night: so that privacy is as much observed here, as one could expect. They have mats made on purpose for sleeping on; and the clothes that they wear in the day, serve for their covering in the night. Their whole furniture consists of a bowl or two, in which they make *kava;* a few gourds; cocoa-nut shells; some small wooden stools, which serve them for pillows; and perhaps a large stool for the Chief or Master, of the family to set upon. (Fig. 8.)

Cook's description is illustrated indirectly by a drawing representing the ceremonious Awa Drinking, which is here reproduced, as it shows well the judicious arrangement of the supporting beams of which the great navigator speaks.

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[7] Cook's Second Voyage. II, p. 21.
[8] Cook's Third Voyage, 1784. I, p. 393.

Next comes the account of William Mariner, a man whose name is honored as that of an accurate observer by all who study the Eastern Pacific. His compulsory residence of several years on the group has given us perhaps the best account of the daily life of that early time that we have.[9] Of Tongan housebuilding his words are few but to the point and may be quoted in full:

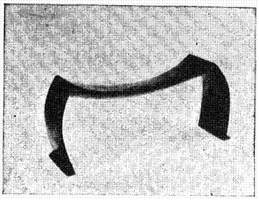

FIG. 7. TONGAN PILLOW.

> *Laga fale*, house-building. Every man knows how to build a house, but those whose business it is have chiefly to erect large houses on marly's, consecrated houses, and dwellings for chiefs. The general form of their houses is oblong, rather approaching to an oval, the two ends being closed, and the front and back open; the sloping thatched roof descending to within about four feet of the ground, which is generally supported by four posts; the larger houses by six, or sometimes more. The chief art in building a house consists in fastening the beams, &c., strongly, with plait of different colours, made of the husk of the cocoa-nut, in such a way as to look very ornamental; the colours, which are black, red and yellow, being tastefully disposed. The thatch of the superior houses is made of the dried leaves of the sugar cane, and which will last seven or eight years without requiring repair. The thatch of the common houses is made of matting formed of the leaves of the cocoa-nut tree, and which lasts about two or three years; but being much easier to make than the other, it ismore frequently used. The flooring is thus made: the ground, being raised about a foot, is beaten down hard, and covered with the leaves of the cocoa-nut tree, dried grass, or leaves of the ifi tree (*Inocarpus edulis*): over this is laid a bleached matting, made of the young leaves of the cocoanut tree. The house consists, as it were, but of one apartment, but which is subdivided occasionally by screens about six or eight feet high. In case of rain, or at night, if the weather is cool, they let down a sort of blind,

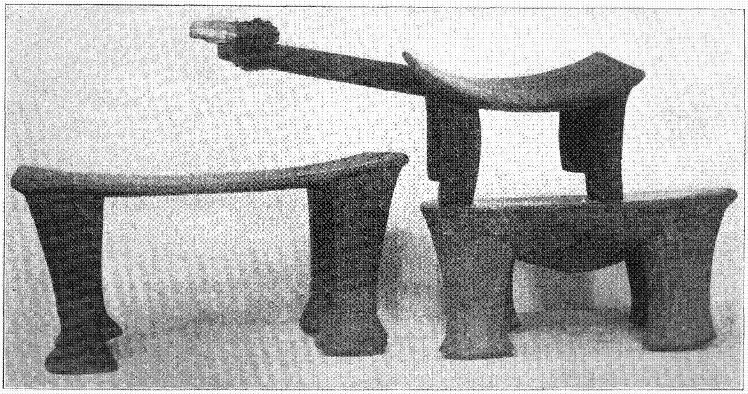

FIG. 8. WOODEN STOOLS.

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[9] An Account of the Natives of the Tonga Islands. Compiled and arranged from the extensive communications of Mr. William Mariner by John Martin, M.D. London, 1817. II, p. 279.

> which is attached to the eaves of the open sides of the house: these blinds are made of long mats, about six inches in width, one above another, and rather overlapping, and are so contrived as to draw up by means of strings, like our Venetian blinds, and are then concealed just within the eaves. The common houses have not these blinds, but, in place of them a few mats hung up as occasion may require.

Half a century passed and we have another record of the Tongan house from a resident of some years, and this seems to fill the few lines undrawn in the former pictures. Even with the example set by King George Tubou, who delighted to build his numerous residences of foreign material in foreign manner, the general character of the Tongan house remained the same as when Cook and Mariner described it. I quote from the interesting account of the Reverend Thomas West:[10]

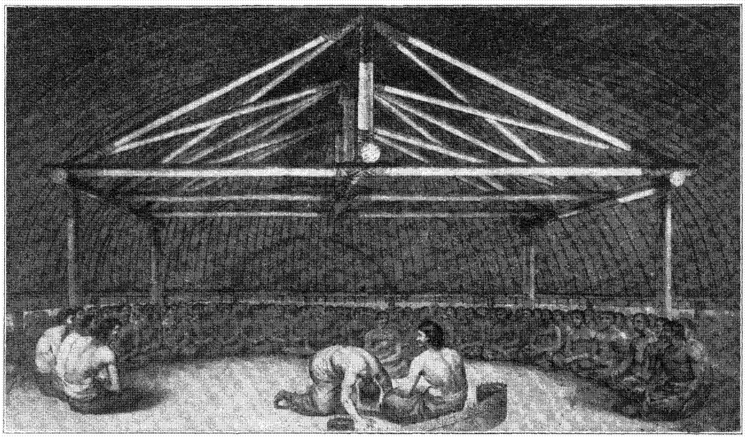

FIG. 9. KAVA DRINKING IN TONGA (PL. 20 OF COOK'S THIRD VOYAGE).

> Nukualofa (the Capital) is intersected by tolerably wide paths, kept scrupulously free from all rank vegetation and dirt. These paths are bounded by the neat reed fences which enclose the *abis* or residential sections of the various chiefs and their retainers. These enclosures are planted largely with useful trees, such as the bread-fruit, banana, cocoa-nut, orange, citron, shaddock, and a variety of shrubs whose overhanging foliage effectually screens the pathways from the intense heat of the sun. Very little order is observed in placing the numerous houses within these enclosures. There are no regular avenues or streets. In fact a house is generally placed where it can obtain the greatest amount of shade from overhanging trees,—a matter certainly of considerable importance in a tropical climate. A casual visitor, therefore, can see but few dwellings even when he has entered within the *tolo a*, or fence of the *abi;* and, until he hunts them out amongst the abounding shrubbery, he wonders where the people live.

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[10] Ten years in South-Central Polynesia: Being reminiscences of a personal mission to the Friendly Islands and their Dependencies. London, 1865, p. 44.

A Tonguese house suits the few necessities and easy habits of the people, but has none of the comforts so essential to a higher type of civilization. With the exception of what may be called public buildings, and a few of the dwellings of the chiefs of highest rank, their dimensions are small, and they contain but two apartments. They are, however, constructed with an eye to neatness and great strength; and when elaborately finished in the best native style, their interior appearance is by no means to be despised. The walls range from four to eight feet in height, and are formed either of a single or double fencing of reeds, which, when interlaced and bound by sinnet to the *tokotuus*, or stakes and posts, planted all round the eaves of the building, resembles very much strong basket-work. These walls are sometimes made more wind and weather tight by the addition of a lining of plaited cocoa-nut leaves; but, at the best, they afford a sorry resistance to strong winds or heavy rains. On the other hand, there is capital ventilation; and perhaps that is of greater importance in such a hot climate, than even freedom from the more occasional annoyances attendant upon stormy weather. To compensate for the lowness of the walls, the roof of a Tonguese house is carried to a considerable height. The rafters are closely set, and are generally made of the outer wood of the cocoa-nut tree, or of the breadfruit tree, the latter of which has much the appearance of cedar wood; and has a very pleasing and beautiful effect when nicely finished. The large beams to which the rafters are attached, are laid along the grooved tops of high and durable posts, which reach about half way up the entire height of roof. The inner ridgepole is usually ornamented by a profusion of sinnet wrappings of varied colors and geometrically interlaced. The roof itself is covered with a thick thatch, made from the leaves of the sugar cane or of the bamboo, and is perfectly water-tight. A well-built house will last a good many years; but the thatching requires to be renewed, under the most favourable circumstances, about once in five years. The floor is laid with a profusion of dried leaves, which are in turn covered over with numbers of mats made from the cocoa-nut leaf, upon which again the finer sitting and sleeping mats are placed. No provision is made in the interior of either native or European house for cooking conveniences. A separate building contains the kitchen requisites, and the heat of the climate renders a fire-place in the dwelling house unnecessary. What is wanting in the architectural beauty of these houses is amply remedied by the loveliness of the natural bowers, from which they peep out upon the passer-by.

With all this detail of the outward appearance not a word of the method of erecting the house. We learn, however, that there has been little or no change from the time of Cook. The marked feature is the open nature of the structure, which was evidently used for something more than a shelter from rain and a bedroom. Turning from Tonga to Samoa we find the same open structure and ground plan, although the Samoans had by no means the close connection with the Tongans that the Fijians had: we shall see later that the latter built a very different house.

Samoan Houses.—In several visits to the Samoan Islands, both at Apia on the island of Upolu and at Pagopago on the island of Tutuila I have visited native houses and to some extent examined their structure; I have been seated on the low fence that is a part of the house structure and serves to keep out pigs and other four-footed unwelcome visitors, and discussed with the hospitable inmates matters relating both to the house and to its furniture, but as the evidence of foreign improvements was incontrovertible (kerosene lamps, crockery, boards, etc.) I prefer to turn to a trust-worthy authority on Samoan houses as on other matters relating to that group half a century ago when the change from ancient to modern was not so perceptible. The Rev. Geo. Turner has recorded[11] for us the following account of the Samoan houses:

> Imagine a gigantic beehive, thirty feet in diameter, a hundred in circumference, and raised from the ground about four feet by a number of short posts, at intervals of four feet from each other all round, and you have a good idea of the appearance of a Samoan house.[12] The spaces between these posts, which may be called open doors or windows, all round the house, are shut in at night [or during stormy weather] by roughly plaited cocoa-nut leaf blinds. During the day the blinds are pulled up, and all the interior exposed to a free current of air. The floor is raised six or eight inches with rough stones; then an upper layer of smooth pebbles; then some cocoa-nut-leaf mats, and then a layer of finer matting. Houses of important chiefs are erected on a raised platform of stone three feet high. In the centre of the house there are two, and sometimes three, posts or pillars, twenty feet long, sunk three feet into the ground, and extending to and supporting the ridge pole. These are the main props of the building. The space between the rafters is filled with what they call *ribs*, viz., the wood of the bread-fruit tree, split up into small pieces, and joined together so as to form a long rod the thickness of the finger, running from the ridge pole down to the eaves. All are kept in their places, an inch and a half apart, by cross pieces, made fast with cinnet. The whole of this upper cagelike work looks compact and tidy, and at the first glance is admired by strangers as being alike novel, ingenious and neat. The wood of the bread-fruit tree, of which the greater part of the best houses are built, is durable, and, if preserved from wet, will last fifty years.

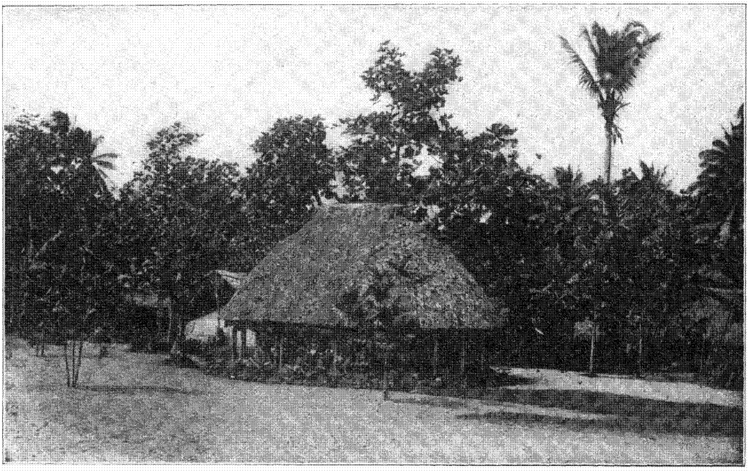

FIG. 10. SAMOAN HOUSE.

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[11] Nineteen Years in Polynesia: Missionary Life, Travels, and Researches in the Islands of the Pacific. London, 1861, p. 256.

[12] It should be noted that the ground plan is elliptical, not circular, as might be inferred from this description.

The thatch, also, is laid on with great care and taste; the long dry leaves of the sugar-cane are strung on to pieces of reed five feet long; they are made fast to the reed by overlapping the one end of the leaf, and pinning it with the rib of the cocoa-nut leaflet, run through from leaf to leaf horizontally. These reeds, thus fringed with the sugar-cane leaves hanging down three or four feet, are laid on, beginning at the eaves and running up to the ridge pole, each one overlapping its fellow an inch or so, and made fast one by one with cinnet to the inside rods or rafters. Upwards of a hundred of these reeds of thatch will be required for a single row running from the eaves to the ridge pole; then they do another row, and so on all round the house. Two, three, or four thousand of these fringed reeds may be required for a good sized house. This thatching if well done will last for seven years. To collect the sugar-cane leaves, and "sew", as it is called, the ends on to the reeds, is the work of the women. An active woman will sew fifty rods in a day, and three men will put up and fasten on to the roof of the house some five hundred in a day. For coolness and ventilation nothing beats the thatch. The great drawback is, that in gales it stands up like a field of corn, and then the rain pours into the house. That, however, may be remedied by a network of cinnet, to keep down the thatch, or by the native plan of covering all in with a layer of heavy cocoa-nut leaves on the approach of a gale.

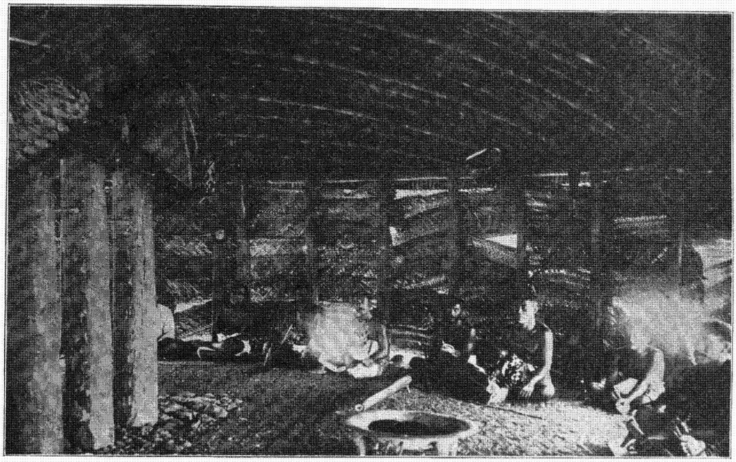

FIG. II. SAMOAN INTERIOR.

These great circular roofs are so constructed that they can be lifted bodily off the posts, and removed anywhere, either by hand, or by a raft of canoes. But in removing a house, they generally divide the roof into four parts, viz., the two sides, and the two ends, where there are particular joints left by the carpenters, which can easily be untied, and again fastened. There is not a single nail in the whole building; all is made fast with cinnet. The arrangement of the houses in a village has no regard whatever to order. You rarely see three houses in a line. Every one puts his house on his little plot of ground just as the shade of the trees, the direction of the wind, the height of the ground, etc., may suit his fancy.

A house, after the usual Samoan fashion, has but *one* apartment. It is the common parlour, dining-room, etc., by day, and the bed-room of the whole family by night. They do not, however, altogether herd indiscriminately. If you peep into a Samoan house at midnight, you will see five or six low oblong *tents* [*tainamu*] pitched (or rather strung up) here and there through the house. They are made of native cloth,[13] five feet high, and close all round down to the mat. They shut out the mosquitoes, and inclose a place some eight feet by five; and these said tent-looking places may be called the *bed-rooms* of the family. Four or five mats laid loosely, the one on the top of the other, form the *bed;* the pillow is a piece of thick bamboo, three inches in diameter, three to five feet long, and raised three inches from the mat by short wooden feet (Fig. 13). After private prayer in the morning, the tent is unstrung, mats, pillow and sheet rolled together, and laid up overhead on a shelf between the posts in the middle of the house.

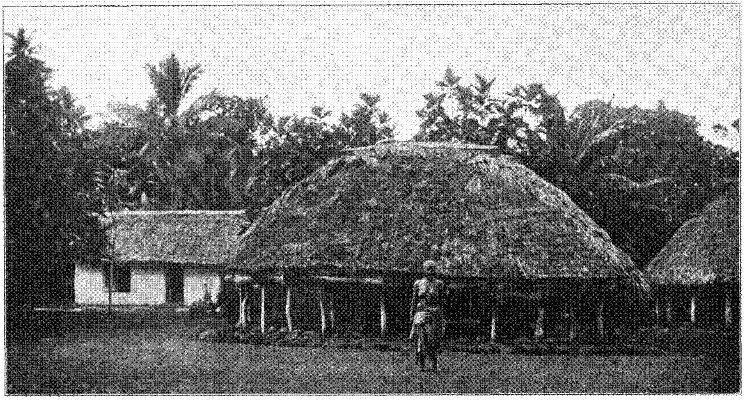

FIG. 12. SAMOAN PALACE.

These rolls of mats and bedding, a bundle or two done up in native cloth, on the same shelf in the centre of the house, a basket, a fan or two, and a butcher's knife stuck into the thatch within reach, a fishing net, a gun strung up along the rafters, a few paddles, a wooden chest in one corner, and a few cocoa-nut shell water-bottles in another, are about all the things in the shape of furniture or property you can see in looking into a Samoan house. The fireplace is about the middle of the house. It is merely a circular hollow, two or three feet in diameter, a few inches deep, and lined with hardened clay. It is not used for cooking, but for the purpose of lighting up the house at night. A *flaming fire*, was the regular evening offering to the gods, as the family bowed the head, and the fathers prayed for prosperity from the "gods great and small". The women collect, during the day, a supply of dried cocoa-nut leaves, etc., which, with a little management, keep up a continued blaze in the evening, while the assembled family group have their supper and prayer and sit together chatting for an hour or two afterwards.

But about *house-building:* it is a distinct trade in Samoa; and perhaps, on an average, you may find one among every three hundred men who is a master carpenter. Whenever this person goes to work, he has in his train some ten or twelve, who follow him, some as journeymen, who expect payment from him, and others as apprentices, who are principally anxious to learn the trade. If a person wishes a house built, he goes with a fine mat, worth in cash value 20s. or 30s. He tells the carpenter what he wants, and presents him with the mat as a pledge that he shall be well paid for his work. If he accept the mat, that also is a pledge that he will undertake the job. Nothing is stipulated as to the cost; that is left entirely to the honor of the employing party. At an appointed time the carpenter comes with his staff of helpers and learners. Their only tools are a felling-axe, a hatchet, and a small adze; and there they sit, chop, chop, chopping, for three, six, or nine months, it may be, until the house is finished. Of old they used stone and shell adzes.

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[13] Siapo or kapa beaten loosely, but still too tight to be endurable for a white man. One in the Bishop Museum No. 2231, is heavily varnished with breadfruit gum.

The man whose house is being built provides the carpenters with board and lodging, and is also at hand with his neighbors to help in bringing wood from the bush, scaffolding, and other heavy work. It is a lasting disgrace to any one to have it said that he paid his carpenter shabbily. It brands him as a person of no rank or respectability, and is disreputable, not merely to himself, but to the whole family or *clan* with which he is connected. The entire tribe or clan is his *bank*. Being connected with that particular tribe, either by birth or marriage, gives him a latent interest in all their property, and entitles him to go freely to any of his friends to ask for help in paying his housebuilder. He will get a mat from one, worth twenty shillings; from another he may get one more valuable still; from another, some native cloth worth five shillings; from another four or six yards of calico; and thus he may collect, with but little trouble, two or three hundred useful articles, worth, perhaps, forty or fifty pounds; and in this way the carpenter is generally well paid. Now and then there will be a stingy exception; but the carpenter, from certain indications, generally sees ahead, and decamps with all his party, leaving the house unfinished. It is a standing custom, that after the sides and one end are finished, the principal part of the payment be made; and it is at this time that a carpenter, if he is dissatisfied, will get up and walk off. A house with two sides and but one end, and the carpenters away, is indicative. Nor can the chief to whom the house belongs employ another party to finish it. It is a fixed rule of the trade, and rigidly adhered to, that no one will take up the work which another party has thrown down. The chief, therefore has no alternative but to go and make up matters with the original carpenter, in order to have his house decently completed. When a house is finished, and all ready for occupation, they have their "house-warming" or, as they call it, its *oven consecration;* and formerly it was the custom to add on to that a dance, for the purpose of "treading down the beetles."

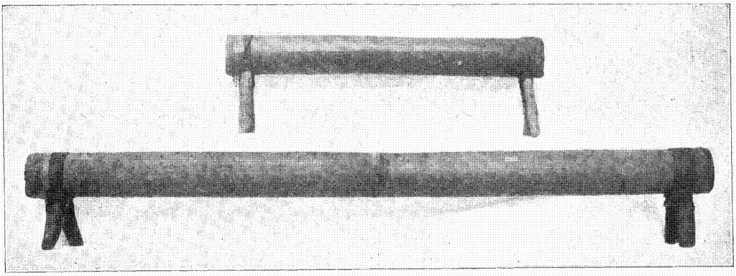

FIG. 13. SAMOAN ALI OR PILLOW OF BAMBU.

Samoan temples (*Fale-aitu*=Spirit house) were built in the same manner as ordinary houses, according to the Rev. J. B. Stair;[14] but in the picture he gives of these structures (Fig. 15) they seem to be round rather than oval. The *fanua-tanu* or raised platform was high in proportion to the respect intended to be shown to the deity to whom the temple was dedicated, or perhaps to the means of the builder. In most cases if it was a family fane all the family were expected to help build it; if a public one all the village turned out and worked.

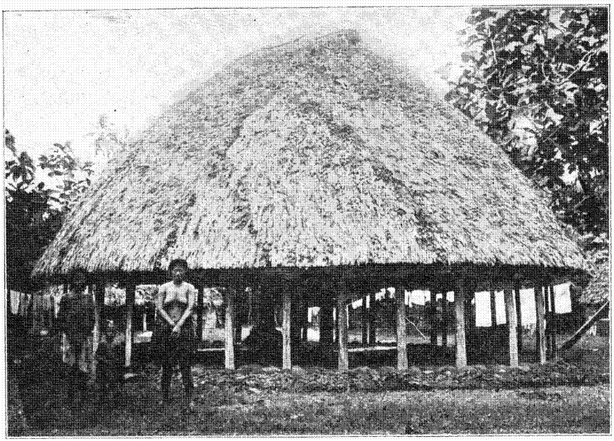

FIG. 14. SAMOAN HOUSE.

It must not be supposed that this temple was what is generally understood by the term, a place in which to worship. A tree might be chosen as the temporary abode of the *aitu* [Hawaiian *akua*], or indeed any secluded place, but the *fale aitu* was usually in the midst of a village and was surrounded by a low fence or hedge. The priests entered these houses, when consulted by the people, to inquire of the god who was supposed to be for the time immanent in the priest and to use his voice for the desired answer. It was then a sort of oracle by which the priest doubtless profited, whether the consultant was satisfied or mystified. The Reverend author goes on to describe a ruin that may throw a side light on the Tongan trilithon. We shall see that the circular plan appears again in New Caledonia. He writes (p. 228):

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[14] Old Samoa, by Rev. J. B. Stair, p. 226. London, 1897.

One very interesting exception to the usual style of building these temples is found in the case of a remarkable old ruin of the *Fale-o-le-Fe'e* (House of the Fe'e), the famous war-god of A'ana and Faleata, the site of which became known to me a short time before leaving Samoa in 1845. This appears to have been built in the usual Samoan style, but its ruins disclose the fact that its builders had used stone slabs for the supporting-posts of the roof, and that it got the name of *O-le-fale-ma'a-o-le-Fe'e* (the stone house of the Fe'e), and hence became enshrouded with much mystery and wonder. I think this is the only instance of such a departure from the usual style of Samoan building known in the islands.

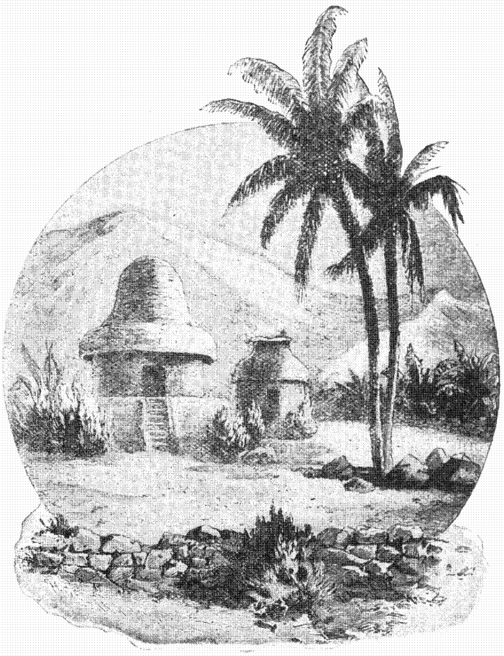

FIG. 15. SAMOAN TEMPLES (FROM STAIR).

It is unfortunate that we have no definite information of the buildings or their ruins in the Manua portion of Samoa which is supposed to be the cradle of the present Samoan population; the island Tau is still noted for its canoe builders.

Fijian Houses. — So far we have had Polynesian housebuilding, and it may seem strange to break the order by omitting the most elaborate form, that of the Maori, for the present, and taking up the work of an entirely different people as the Pacific islanders are generally classified, but my reason is not only founded on the geographical relation of the Vitian group to those whose housebuilding has already been described, but on the close relationship of form and manner of building, which as we shall see later on, nearly resembles that of the Hawaiians.

It is perhaps unnecessary to go farther back than the time of the United States Exploring Expedition (1840), for foreign influence had made little, if any, change in the manner of building dwellings, although the advance of missionary work was soon to destroy the Fijian temples. The account of the houses as given by Captain Wilkes in his Narrative[15] is rather fragmentary, probably made up from the journals of the various officers, but it gives a definite picture of the Fijian habitation as it was, and as it is in many parts of the great Vitian archipelago, parts of which if turned from cannibalism, are otherwise as they were when white men first visited the group. Captain Hudson, the second in command, and who will also be remembered as the commander of the Niagara in the laying of the first Atlantic cable, had been sent to amuse the king at Rewa with fireworks, and in the rainy weather he proceeded at once to the king's house, which is thus described:

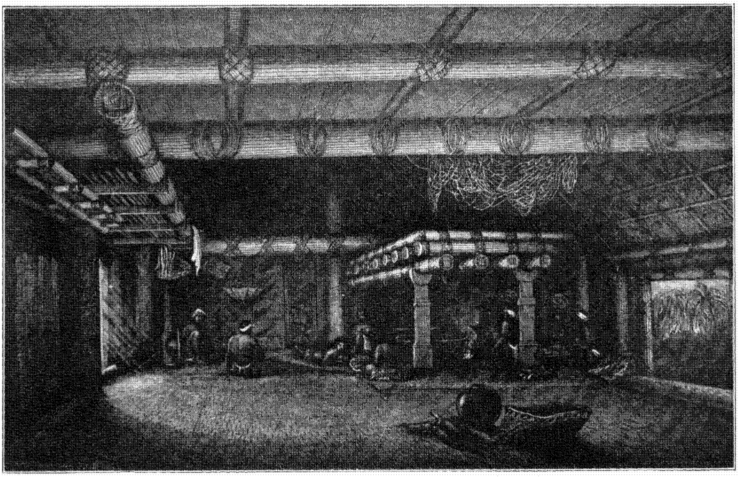

FIG. 16. INTERIOR OF NGARANINGIOU'S HOUSE, REWA (BY A. T. AGATE).

> The house is large, and in shape not unlike a Dutch barn: it is sixty feet in length and thirty in width; the eaves were six feet from the ground, and along each side there were three large posts, two feet in diameter and six feet high, set firmly into the ground; on these were laid the horizontal beams and plates to receive the lower ends of the rafters; the rafters rise to a ridge-pole thirty feet from the ground, which is supported by three posts in the centre of the building. They were of uniform size, about three inches in diameter and eighteen inches apart. The usual thick thatch was in this case very neatly made. The sides of the house were of small upright reeds, set closely together. All the fastenings were of sennit, made from the husk of the cocoa-nut. Some attempts at ornament were observed, the door-posts being covered with reeds wound around with sennit which

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[15] Narrative of the United States Exploring Expedition, during the years 1838–1842, by Charles Wilkes, U. S. N., vol. iii, p. 113 (edition of 1845).

had a pretty effect. There are two doorways, one on each side; these are only about three feet in height, and are closed by hanging mats. * * * * * * On one side of the house, as is usual among the Feejeeans, the cooking place is excavated, a foot deep and about eight feet square; this was furnished with three large earthen pots of native manufacture.

Of a *mbure* (sacred or memorial house) they say:

The mound on which it is built is an artificial one, ten feet high: The mbure is about twelve feet square, and its sides or walls only four feet high; while its high pitched roof rises to the height of about thirty feet. The walls and roof of the mbure are constructed of canes about the size of a finger, and each one is wound round with sennit as thick as a cod line, made from the cocoa-nut husk. At a little distance, the whole house looked as though it was built of braided cord.

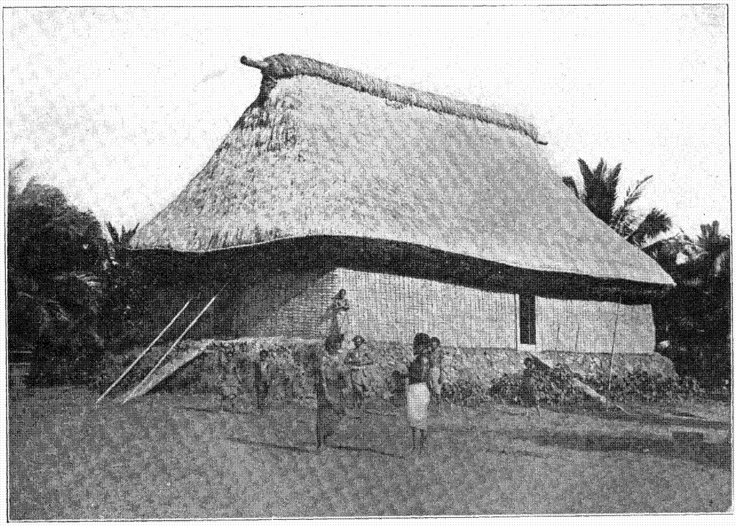

FIG. 17. FIJIAN HOUSE OF MODERN TIMES.

Again, on page 343, this general description is given:

Their houses differ from those of the other groups, although they are constructed of similar materials. The frame and sills are made of the cocoa-nut and tree fern, they have two doorways, on opposite sides, from three to four feet high, and four feet wide; the posts are set in the ground and are placed about three feet apart; the rafters of the palm tree are set upon a plate resting on the post; these have a very steep pitch, and support a cocoa-nut log, that forms the peak of the roof; the ends of the peak extend beyond the thatching at each end, and are covered with shells (*Ovulum ovum*). The thatching is peculiar being thickest at the eaves. To make the roof they begin at the peak,[16] whence they thatch down with the wild sugar-cane, under which they place fern leaves. These gradually increase in quantity until they reach to the eaves, which are about two or three feet thick, project some distance over the sides and are cut off square.

The sides are closed in with small cane, in square wickerwork, and not in diamond shape, as those of Tonga. Mats are hung before the doors. The common houses are oblong, from twenty to thirty feet in length, and fifteen feet high. Some of the best class of buildings, belonging to the chiefs, are exceedingly well and ingeniously built. If a person wishes to build a house, he carries a present of a whale's tooth to the king or chief, and tells him his wish, the size, &c. The king or chief orders the men who are generally employed for such purposes, to prepare the timber and get all things ready. The direction is given to some one as the chief superintendent, and from one to five hundred men are employed, as may be deemed necessary. The house is finished in ten or fifteen days, and will last about five years without repairs to its thatching. They are, however, generally considered tenantable for twenty years, or upwards. All the houses have fire-places a little on one side of the centre; these are nothing more than an ash-pit, with a few large stones to build the fire and place the pots on. The same kind of fire-place is to be found in the mbures, where a fire is kept burning night and day, which they believe the *kalou* or spirit requires. The houses generally are not divided by partitions, but at each end they are raised about a foot above the centre floor. These elevations are for sleeping, and are covered with layers of mats until they are soft and pleasant to lie on. In sleeping they use a pillow made of a piece of bamboo or other species of wood, about two inches in diameter, with four legs; this is placed immediately under the neck, and is sufficiently high to protect their large head of hair from being disarranged.

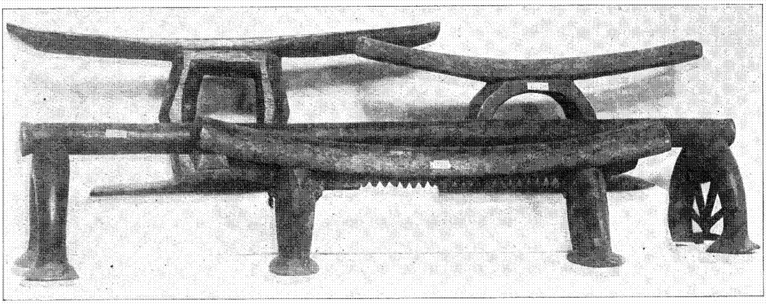

FIG. 18. FIJIAN PILLOWS IN THE BISHOP MUSEUM.

From the constant use of this pillow, a scirrhous lump, as large as a goose-egg, is often formed on the nape of the neck. This pillow was undoubtedly brought into use to protect their peculiar fashion of wearing their hair; and from the inquiries made, I found it had been used from time immemorial. Many of these pillows are carved and ornamented, and a chief always travels with his own.

Again we must turn to a devoted missionary who has lived among the Fijians and has used his eyes to good advantage. Wilkes was perhaps abreast of his times in way of gathering information, and he had the help of scientific men of undoubted ability, but in matters of ethnology very little that was precise was obtainable, or at least obtained, by the explorers of those times. It seems very unfortunate that when old customs and people still existed, there were no trained ethnologists, and when the advance of scientific methods has put many ardent explorers in the way, both people and customs have almost vanished from the earth. My honored friend Dr. Charles Pickering, who was the ethnologist of the expedition, did what he could in the "Races of Man", but anthropological measurements were not thought of, or at least wanting, and generalization took the place of the prying questions and minute observations of the present day. Anthropologists today know more about an individual negro than was known in 1840 about the whole Fijian race,—nay, than was known of all the peoples of the vast Pacific Ocean.

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[16] This is a mistake, as will be seen later on.

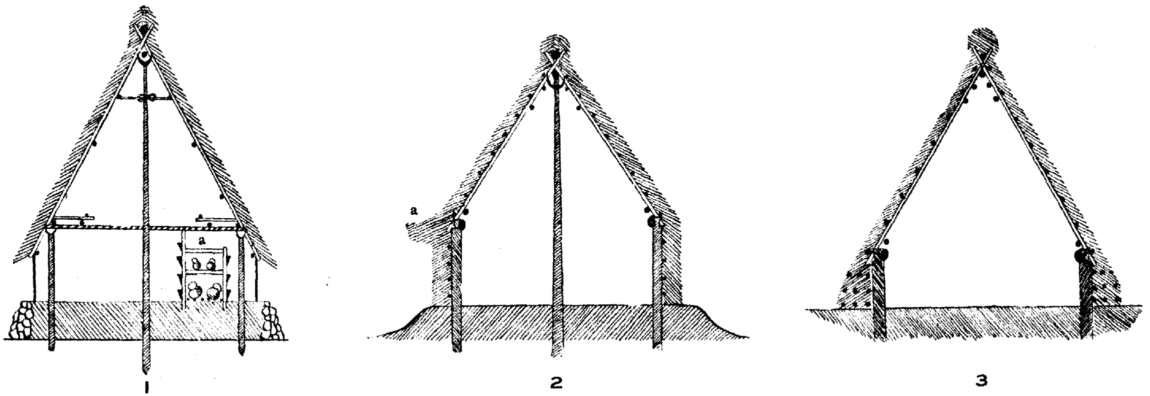

FIG. 19. SECTIONS OF FIJIAN HOUSES.

Until modern methods and instruments shall be employed in an exploration of the islands of the Great Ocean we must be content with the brief, imperfect sketches the old voyagers have given us, illumined here and there by the gleams thrown on these dark places by some missionary, who understanding his own needs studies the people he goes among with the benevolent purpose of saving such souls as they may have from eternal destruction, and by these studies saves many a chapter from the story of their lives which would otherwise have been lost more certainly. To such workers in the vineyard of the Lord every true scientist gives hearty acclamation, whatever he may think of their theological beliefs or teachings. One of the excellent missionaries, the Reverend Thomas Williams, has given in his very interesting and instructive book on this group, where he worked many years, the following account of housebuilding there:[17]—

> The form of the houses in Fiji is so varied, that a description of a building in one of the windward islands would give a very imperfect idea of those to leeward, those of the former being much the better. In one district a village looks like an assemblage of square wicker baskets; in another, like so many rustic arbours; a third seems a collection of oblong hayricks with holes in the sides,

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[17] Fiji and the Fijians, 2 vols. London, 1858. I, p. 79.

while in a fourth these ricks are conical. By one tribe just enough framework is built to receive the covering for the walls and roofs, the inside of the house being an open space. Another tribe introduces long centre posts, posts half as long to receive the wall-plates, and others still shorter, as quarterings to strengthen the walls; to these are added tie-beams, to resist the outward pressure of the high-pitched rafters, and along the side is a substantial gallery, on which property is stored. The walls or fences of a house are from four to ten feet high; and, in some cases, are hidden on the outside by the thatch being extended to the ground, so as to make the transverse section of the building an equilateral triangle. [3, Fig. 19.] The walls range in thickness from a single reed to three feet. Those at Lau (windward) have the advantage in appearance; those at Ra (leeward) are the warmest. At Lau the walls of Chief's houses are three reeds thick, the outer and inner rows of reeds being arranged perpendicularly, and the middle horizontally, so as to regulate the neat sinnet-work with which they are ornamented. At Ra, a covering of grass or leaves is used, and the fastenings are vines cut from the woods; but at Lau sinnet is used for this purpose, and patterns wrought with it upon the reeds in several different colours. A man, master of difficult patterns, is highly valued, and his work certainly produces a beautiful and often artistic effect.[18] Sometimes the reeds within the grass walls are reticulated skilfully with black lines. The door-posts are so finished as to become literally reeded pillars; but some use the naturally carved stem of the palm-fern instead. Fire-places are sunk a foot below the floor, nearly in the centre of the building, and are surrounded by a curb of hard wood. In a large house, the hearth is twelve feet square, and over it is a frame supporting one or two floors, whereon pots and fuel are placed. [1, Fig. 19.] Sometimes an elevation at one end of the dwelling serves as a divan and sleeping place.

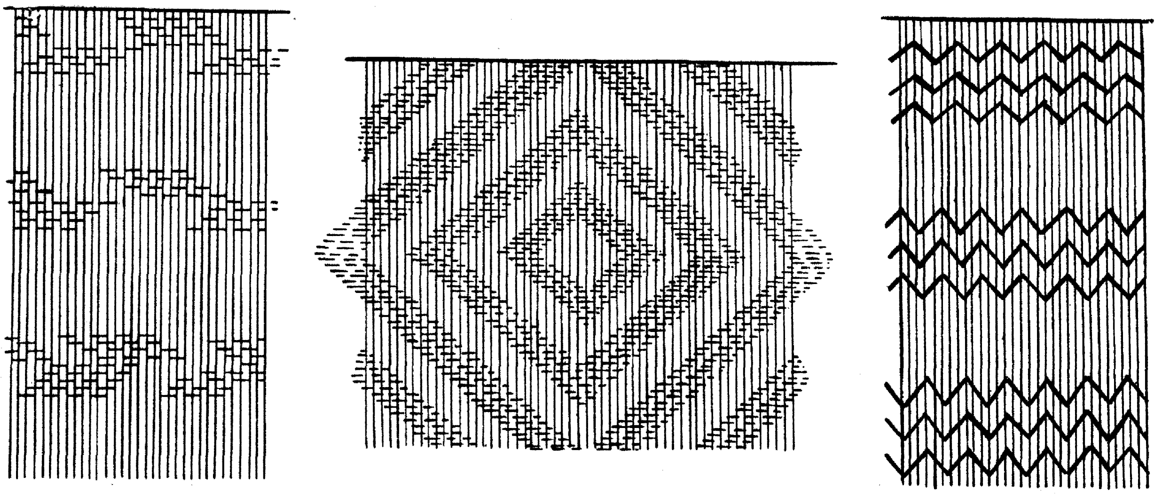

FIG. 20. SINNET WORK ON WALLS, FIJI.

Slight houses are run up in a short time. When at Lakemba, I passed a number of men who had just planted the posts of a house twenty feet long. I was away, engaged with a Tongan Chief, for about an hour and a half, and on my return was amazed to see the house finished, except the completing of the ridge. An ordinary house can be built in a fortnight; the largest require two or three months. A visitor, speaking of Tanoa's[19] house, says, "It surpasses in magnitude and grandeur anything I have seen in these seas. It is one hundred and thirty feet long, forty-two feet wide, with massive columns in the centre, and strong, curious workmanship in every part." Excellent timber being easily procured, houses from sixty to ninety feet long, by thirty feet wide, are built, with a framework which, unless burnt, will last for twenty years. The wood of the bread-fruit tree is seldom used; *vesi* the green-heart of India, *buabua*, very like box-wood, and *cevua*, bastard sandal-wood, being more durable. A peculiarity of the Fijian pillar spoils its appearance. Where the capital is looked for, there is a long neck just wide enough to receive the beam it supports. A pillar two feet in diameter is thus cut away at the top to about six inches.

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[18] This work should be compared with the similar work of the Maori shown below.

[19] A remarkable Chief of Mbau, father of Thakombau the cannibal king of Mbau and later of all Fiji, who was converted to Christianity largely by the counsel and example of George Toubou, King of Tonga.

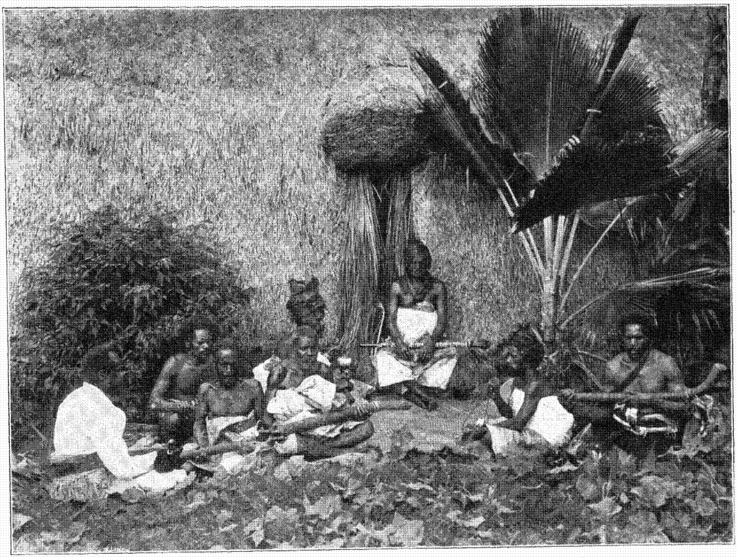

FIG. 21. DOOR OF A FIJIAN HOUSE TO SHOW THE PENT.

Ordinary grass houses have no eaves [3, Fig. 19]; but there is over the doorway a thick semi-circular projection of fern and grass, forming a pent. [2, Fig. 19 and Fig. 21.] Some houses have openings for windows. The doorways are generally so low as to compel those who enter to stoop. The answer to my inquiry why they were so, often reminded me of Proverbs xvii, 19.[20] Although the Fijian has no mounted Arab to fear, he has often foes equally subtle, to whom a high doorway would give facility for many a murderous visit.

Temples, dwelling-houses, sleeping-houses, kitchens, (Lau) inns or receiving houses for strangers (*mbure ni valagi*), and yam stores are the buildings of Fiji.

For thatching, long grass, or leaves of the sugar-cane and stone palm, are used. The latter are folded in rows over a reed, and sewn together, so as to be used in lengths of four or six feet, and make a very durable covering. The leaves of the sugar-cane are also folded over a reed; but this is done on the roof, and cannot be removed, as the other may, without injury. The grass or reed thatch is laid on in rather thin tiers, and fastened down by long rods, found ready for use in the mangrove forests, and from ten to twenty feet long, and secured to the rafters by split rattans. Some very good houses are covered first with the cane leaves, and then with the grass, forming a double thatch. Sometimes the eaves are made two feet thick with ferns, and have a good effect; but, when thicker, they look heavy, and, by retaining the wet, soon rot.

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[20] He that raiseth high his gate seeketh destruction.

The ridge of superior buildings receives much attention. The ends of the ridgepole project for a yard or more beyond the thatch, having the extremities blackened, and increasing with a funnel-shape, and decorated with large white shells (*Ovulum ovum*). The rest of the ridge is finished as a large roll bound with vines, and on this is fixed a thick, well-twisted grass cable; another similar cable is passed along the under side of the roll, having hung from it a row of large tassels. All foreigners are struck with the tasteful character of this work, and lament that its materials are not more durable. I have seen several houses in which the upper edge of the eaves was finished with a neat braid. The thatchers, contrary to the statement in the "U. S. Exploring Narrative," always begin at the eaves and work upwards.

A more animated scene than the thatching of a house in Fiji cannot be conceived. When a sufficient quantity of material has been collected round the house, the roof of which has been previously covered with a net-work of reeds, from forty to three hundred men and boys assemble, each being satisfied that he is expected to do some work, and each determined to be very noisy in doing it. The workers within pair with those outside, each tying what another lays on. When all have taken their places, and are getting warm, the calls for grass, rods, and lashings, and the answers, all coming from two or three hundred excited voices of all keys, intermixed with stamping down the thatch, and shrill cries of exultation from every quarter, make a miniature Babel, in which the Fijian—a notorious proficient in nearly every variety of halloo, whoop and yell—fairly outdoes himself. All that is excellent in material or workmanship in the Chief's houses, is seen to perfection and in unsparing profusion in the *mbure* or temple.

An intelligent voyager observes:

> In architecture the Fijians have made no mean progress; and they are the only people I have seen, among those classed by Europeans as savages, who manifested a taste for the fine arts; while, as with the ancient Greeks, this taste was universal.[21]

I think my reader will agree with me that Mr. Williams has given us a very complete account of the Fijian house and its building; I can hear the noise of its builders as I recall similar scenes in the Hawaiian Islands and elsewhere in the Pacific—the Fijian has no monopoly of noise, and if he can beat a modern Hawaiian game of "bawl" I am much mistaken. Dr. Pickering is right in his estimate of the artistic tendencies and even achievements of this interesting group of cannibals, for this they certainly were when they in some former day contrived the plan and form of their houses which possess at least one prime requisite of true Art, pleasing and satisfying to a cultured mind. There is but one tribe in the Pacific that can contest the supremacy in architecture with them, and this too is a people of inveterate cannibalistic tastes, the Maori of New Zealand. I have elsewhere called attention to the curious fact that anthropophagous people seem to produce the most elaborate ornamentation, and here I must add to their credit the most artistic housebuilding. If the Fijian excels in beauty of form and proportion, the Maori excites our surprise and pleasure in his carved work, which as used in housebuilding seems to take the lead.

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[21] Pickering's "Races of Man", p. 155.

There is a chapter of Fijian housebuilding that has been omitted from all the accounts already quoted, but which I do not propose to skip, for the matter is also a part of Hawaiian practice as well; I refer to the human sacrifice usual at the planting of the corner posts (or at least of one) of any important building, whether it be for the use of the gods or of the chiefs. I quote from an author thoroughly cognizant of Vitian customs, Lorimer Fison:[22]

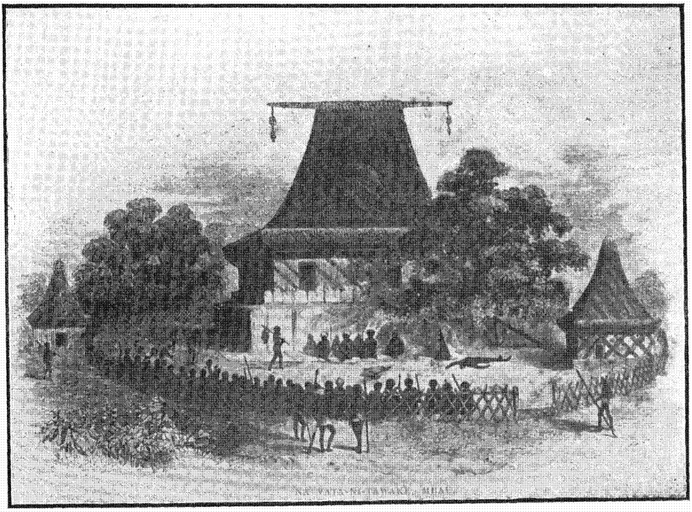

FIG. 22. VIEW OF A MBURE IN MBAU.

> The *Vaka-sombu-ninduru*, literally, the "lowerers of the post", were men killed when the corner-posts of a heathen temple, or a great chief's house, were lowered into the holes dug for them. The god in whose honor the temple was being erected, or the chief whose house was building, would be dishonored if no human life were taken when the posts were set up; and it used to be of no uncommon occurrence for a living man to be placed standing in each post-hole, and there buried alive by the side of the post, the hole being filled up and the earth rammed down over him. But a few years ago there were houses in Fiji, on whose floor the babe and its mother slept, and little children played, while within hand-reach underground grim skeletons stood embracing the corner posts with their

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[22] Tales from Old Fiji, by Lorimer Fison. London, 1904. xv.

fleshless arms. It is even probable that there are houses of this description still standing at the present day. At the root of this horrible practice we may doubtless recognize the once widespread superstition that the sacrifice of a human victim, when a foundation was being laid, propitiated the gods and secured the stability of the building.

When the house timber was cut and ready for hauling from the forest, then also men were slain who were called *Yara-ninduru* or "draggers of the post"; the setting up of the first pair of rafters was celebrated by a cannibal feast, whose victims were called *Lalawa-ni-sa*, or "rafter tiers", and when the building was finished other unfortunate wretches were killed and eaten. These were known as *Vaka-voti-voti*, a word whose etymology I am unable to explain.

In another place Mr. Fison tells of an old chief in a corner of whose dwelling were buried some fifteen of his children, most of them murdered by their father, so it would seem unlikely that these people had arrived at the luxury of a haunted house! It will be noticed that with exception of the post victims, the offerings were eaten, not simply offered to the gods.

Lest this custom of the Pacific Islanders, which shocks the modern feelings, should be considered a mark of especial depravity or hardness of heart, let me state that even in Christian countries and in the case of Christian churches the survival of this human sacrifice is a matter of history, and modern history at that. I quote from S. Baring-Gould's "Strange Survivals", 1895, p. 13:

> In 1885, Holsworthy parish church was restored, and in the course of restoration the south-west angle wall of the church was taken down. In it, embedded in the mortar and stone, was found a skeleton. The wall of this portion of the church was faulty, and had settled. According to the account of the masons who found the ghastly remains, there was no trace of a tomb, but every appearance of the person having been buried alive and hurriedly. A mass of mortar was over the mouth, and the stones were huddled about the corpse as though hastily heaped about it, then the walls were leisurely proceeded with.

The tradition of the ramparts of Copenhagen given by Thiele in his "Danish Folk-tales" is, there can be no doubt, founded on fact. As the walls of the ramparts would not stand firm on the poor foundation, the builders took a little girl, placed her in a chair by a table on which were sweetmeats and playthings to amuse her, and then a dozen masons rapidly built a vault over her, covering it with earth, and drowning the innocent child's cries with drums and trumpets. Baring Gould tells us that a few years ago, when the Bridge Gate in the Bremen walls was demolished, the skeleton of a child was actually found imbedded in the foundation. The same author we quote:

> In the walls of the ancient castle of Henneberg, the seat of a line of powerful counts, is a relieving arch, and the story goes that a mason engaged on the castle was induced by the offer of a sum of money to yield his child to be built into it. The child was given a cake, and the father stood on a ladder superintending the building. When the last stone was put in the child screamed in the wall, and the man overwhelmed with self-reproach, lost his hold, fell from the ladder, and broke his

neck. A similar story is told of the castle of Liebenstein. A mother sold her child for the purpose. As the wall rose about the little creature, it cried out, "Mother I still see you!" Then later "Mother I can hardly see you!" And lastly, "Mother I see you no more!"

The Roman had, however, substituted for human sacrifice the offering of other animals. Livy tells us (xxii, 57), "Interim ex fatalibus libris sacrificia aliquot extraordinaria facta: inter quae Gallus et Galla, Graecus et Graeca, in Foro Boario sub terra vivi demissi sunt in locum saxo conseptum, jam ante hostiis humanis, minime Romano sacro, imbutum."

Mahometans vied with Christians in these human sacrifices to secure stability of walls, and the well authenticated case of Geronimo of Oran, a Christian who was bedded in a block of concrete September 18, 1569, and the block built into the wall of a fort near the Bab-el-oved, Algiers, seems the last recorded instance of these human sacrifices. In 1853 the block was removed from the wall and the remains with the cast of the head are now in the Cathedral of Algiers.

So late as 1843, when a new bridge was to be built at the University town of Halle, in Germany, the people assured the architect and masons that they could never make the piers stand unless they first immured a living child in the foundation. During the Boxer troubles in China, it was charged against the Christian missionaries that they were trying to get Chinese children to build into the wall of a new church (much as the Christians have repeatedly charged the Jews with stealing Christian children for sacrifice), and it is not astonishing when we consider the words of Scripture, understood literally by an uneducated and partly hostile audience, "Ye also, as living stones, are built up a spiritual house" (I Peter, ii, 5), and the familiar hymn,

Blessed city, heavenly Salem,
  Vision dear of peace and love,
Who of living stones upbuilded,
  Art the joy of heaven above.

Let us not then blame the Polynesians for a superstition which seems world wide and powerful enough to survive and be a moving force to the present day among some of the Asiatic nations.

I have before me some charming views of Fijian houses taken by my friend J. W. Lindt, the distinguished photographer of Melbourne, which will give my reader pleasure as well as instruction if they can be reproduced with the beauty of the originals. These are on Plates XVIII and XIX. The first shows Na Kali village on the shore of Viti Levu, and the inhabitants as well as their dwellings are brought vividly before us. The builder of the principal house has utilized a great rock in piling up his platform, and this does not extend beyond the walls of the house. The usual pent is distinct over each door; and the ridge seems more neatly finished than the rest of the house thatch; the water comes to the platform and the waterward door has a steep log ladder that only bare feet could safely pass. In such a peaceful scene we can forget the skeleton in the posthole: Fijian houses have no closets!

The lower figure on the same plate shows a long house under the spreading branches of a breadfruit tree, a house that distinctly shows eaves. This is in Waitovu village on the island of Ovalau. The rustic scene surely seems far from the cannibalism of ancient times, and the fierce Fijian has as peaceful home as the indolent Tahitian.

In Plate XIX the upper figure represents the palace of the king of Mbau, the little island noted for the warlike character of its people, where Tanoa and his better known son Thakombau lived. The house has windows,—the first of this foreign innovation we have seen in Fiji; and the cottage perched upon the neat fence is an equal novelty. The way in which the ridgepole is bound to the thatch is clearly shown, especially in the smaller building. The fine canoe in the foreground shows that the house is along the shore and not on the higher part of Mbau. As the Hawaiians, so the Fijians hugged the shore, and in many of the Fijian islands it is difficult to travel inland; all intercourse is by water. Less than a century before this picture was taken, such a canoe as that shown would have been launched by its savage owner on rollers each a human being!

The lower figure shows a house of ordinary form built on the ground, and in the absence of the protecting platform, the low stakes outside the door keep out the pigs, a contrivance sometimes used by the Hawaiians in similar circumstances. The young woman coming from the house has a ladder of bambu neatly bound together with sennit, and her basket suggests an expedition for breadfruit.

New Zealand Houses.—Although Tasman discovered New Zealand he never landed there, and until Cook landed there a century and a quarter afterwards, the civilized world knew nothing of the inhabitants except that they had murdered some of Tasman's crew. Cook spent nearly a year about the group, but his report gives us little information about the housebuilding. What is known as Cook's First Voyage was edited by Dr. Hawkesworth from such material as he found in the journals of all the officers of the expedition. In this we read:[23]

> Their houses are the most inartificially made of anything among them, being scarcely equal, except in size, to an English dog-kennel; they are seldom more than eighteen or twenty feet long, eight or ten broad, and five or six high, from the pole that runs from one end to the other and forms the ridge, to the ground; the framing is of wood, generally slender sticks, and both walls and roof consist of grass and hay, which, it must be confessed, is very tightly put together; and some are

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[23] Cook's First Voyage, III, 437.

also lined with the bark of trees, so that in cold weather they must afford a very comfortable retreat. The roof is sloping, like those of our barns, and the door is at one end, just high enough to admit a man, creeping upon his hands and knees: near the door is a square hole, which serves the double office of window and chimney, for the fire-place is at that end, nearly in the middle between the two sides: in some conspicuous part, and generally near the door, a plank is fixed, covered with carving after their manner; this they value as we do a picture, and in their estimation it is not an inferior ornament; the side walls and roof project about two feet beyond the walls at each end, so as to form a kind of porch, in which there are benches for the accommodation of the family. That part of the floor which was allotted for the fire-place, is enclosed in a hollow square, by partitions either of wood or stone, and in the middle of it the fire is kindled. The floor along the inside of the walls, is thickly covered with straw and upon this the family sleep. Some of the better sort, whose families are large, have three or four houses enclosed within a court yard, the walls of which are constructed of poles and hay and are about ten or twelve feet high.

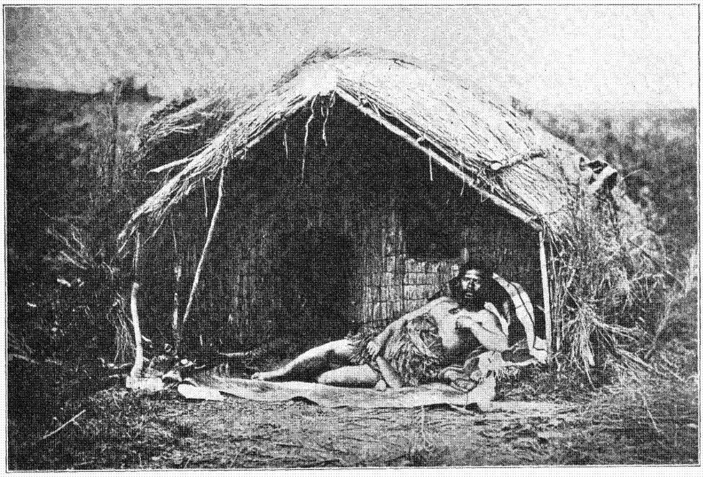

FIG. 23. MAORI HOUSE.

When we were on shore in the district called Tolaga, we saw the ruins, or rather the frame of a house, for it had never been finished, much superior in size to any that we saw elsewhere; it was thirty feet in length, about fifteen in breadth, and twelve high; the sides of it were adorned with many carved planks, of a workmanship much superior to any other that we had met with in the country; but for what purpose it was built, or why it was deserted, we could never learn.

This carved house, we shall see presently, was one of the buildings that make the Maori architecture noteworthy, but in the meantime we may note what Cook himself says in his Journal (p. 223) which has only recently (in 1893) been published exactly as the great navigator wrote it:

The Houses of these People are better calculated for a Cold than a Hot Climate; they are built low and in the form of an oblong square. The framing is of wood or small sticks, and the sides and Covering of thatch made of long Grass. The door is generally at one end, and no bigger than to admit of a man to Creep in and out; just within the door is the fireplace, and over the door, or on one side, is a small hole to let out the Smoke. These houses are twenty or thirty feet long, others not above half as long; this depends upon the largeness of the Family they are to contain, for I believe few Familys are without such a House as these, altho' they do not always live in them, especially in the summer season, when many of them live dispers'd up and down in little Temporary Hutts, that are not sufficient to shelter them from the weather.

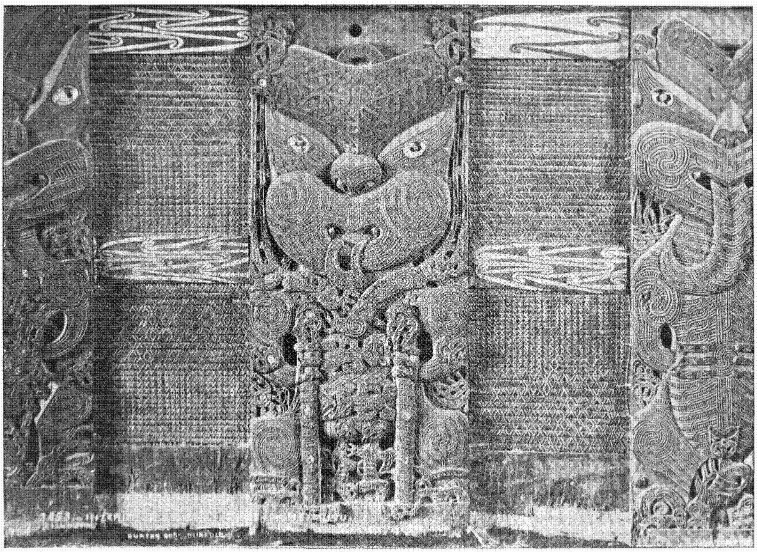

FIG. 24. POUPOU AND TUKUTUKU AT OHINEMUTU.

This is the first group of those whose housebuilding we have glanced at, that extends beyond the Tropics and, in the southern part, into a decidedly cold climate. Snow-capped mountains with glaciers and extensive mountain lakes lower the temperature even in summer, and we should naturally expect a very different form of building from the veranda-like houses of Tahiti or Samoa. While hurricanes do not visit New Zealand as they do Fiji, Samoa, and the southeastern Pacific generally, yet the prevailing winds are in places very severe, as at Invercargill, where trees hardly venture to grow above the shelter of stone walls, and even in the charming city of Wellington there are storms of wind and rain that make a tight house necessary for comfort. On the northern island where the climate passes into the subtropical, the houses of the aborigines are still well enclosed against the weather. In the King Country, on the Wanganui River, I have seen houses such as Cook describes, and others with more or less carved ornamentation. At Ohinemutu in the Hot Spring district are good examples of the carved houses. All of the illustrations are of houses or parts of houses that I have seen, and many of the houses I have examined with some care. I will give one more description of the Maori house in modern time, and it will be seen that there is little difference from the pictures left us by the first discoverers, so far as the general plan is concerned. In the matter of decoration there has undoubtably crept in unmistakable traces of foreign influence, but this is of little importance if we know the fact. The most modern as well as the most complete description of the dwellings of the Maori has been given by Mr. Augustus Hamilton,[24] but to his admirable work

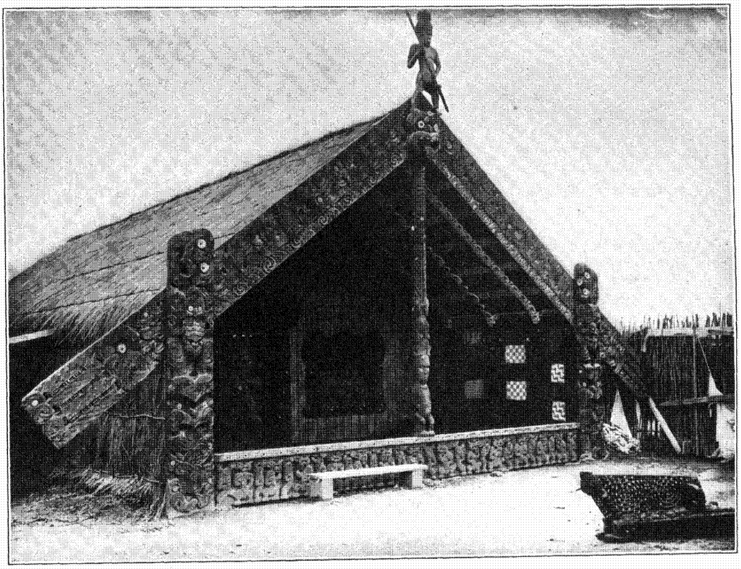

FIG. 25. A MAORI HOUSE.

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[24] The Art Workmanship of the Maori Race in New Zealand. Dunedin, 1896, p. 79. Published by the New Zealand Institute.

I must refer those who wish to go more fully into the detail of the Maori house, as Mr. Hamilton's work is doubtless accessible in all good libraries. I shall, however, quote from Mr. Hamilton's work where there is need to explain or modify the account, much more brief, given by Rev. Richard Taylor[25] which I have decided to quote in full:

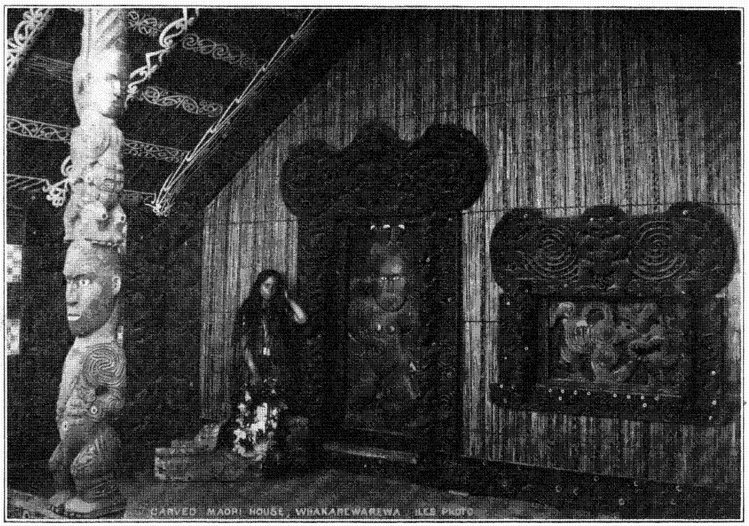

FIG. 26. ENTRANCE OF A MODERN CARVED HOUSE.

> The European traveller who crawls into a native hut for the first time, will see nothing particularly interesting in it; he will perhaps, only view it as a dark smoky hovel; but when he becomes acquainted with native customs, and observes the order and arrangement displayed, the careful way it is constructed, and how perfectly the object aimed at is attained, he will not withhold its meed of praise.
>
> The principal houses are called *whare puni*, or warm houses; this name may be given either from the number of persons generally residing in them, or from their being so built as to exclude the external air; they are usually sunk one or two feet in the earth, and nearly always front the sun; the sides of one are seldom more than four feet high, being formed of large broad slabs of totara (*Podocarpus totara*), the most durable timber, having a small circular groove or opening cut into the top to receive the rafters; these slabs are either adzed, and painted with red ochre, or, if it be a very superior house, each one is grotesquely carved to represent some ancestor of the family, in which case they become a kind of substititute for the nobleman's ancestral picture gallery; between these posts there is generally a space of two feet, which is filled up with a kind of lattice-work, composed

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[25] Te Ika a Maui; or New Zealand and Its Inhabitants. Second edition. London, 1870, p. 500.

of slender laths, dyed black, white, or red, and bound together with narrow strips of the kiekie (*Freycinetia banksii*) leaf, very tastefully disposed in patterns; this is called arapake; there is also a skirting board (*papa whai*) painted red; and the rafters which are either carved or painted with different colored ochres, rest on a ridge pole (*tahuhu* or *tahu*), in which a notch is cut to receive them. This ridge pole is always the entire length of the building, including that of the verandah, being generally of a triangular shape, and very heavy; it is supported by a post or pillar (*pou tahu*) in the middle of the house, the bottom of which is carved in the form of a human figure representing the founder of the family—and is thus a kind of lares; immediately before the face of this figure is the fire-place, a small pit formed by four slab stones sunk into the ground; perhaps this is some relic of ancient fire-worship in the position of the fire, which, as a domestic altar, always burns before the face of the image of their deified ancestor.

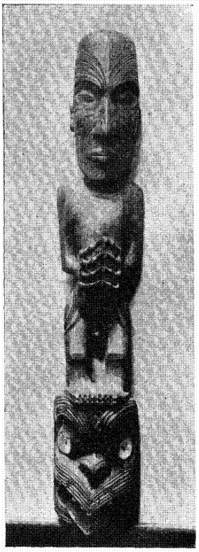

FIG. 27. TEKOTEKO FROM MAORI GABLE.

The entrance to the house is by sliding door (*tatau*), which is formed of a solid slab of wood, about two feet and a half high, and a foot and a half wide; the way of fastening it when the owners were absent, was by means of a stick, which passed through a loop in the door and crossed the side posts; it could of course be opened by any one, but was always regarded as tapu; they were also accustomed to secure their doors by complicated knots, when likely to be absent for any length of time. On the right side of this is a window (*matapihi*), generally about ten inches high and two feet wide; this also is furnished with a slide which goes into the wall of the building; another window is placed in the roof, a kind of trap-door, termed a *pihanga* or *puhanga*, literally gills or lungs, a breathing place, more than an aperture for admitting light, which is not required in a *whare-puni* at night. On entering, there is a low slab of wood on either side, to partition off the sleeping places, leaving a path down the middle, that nearest the door being about eighteen inches high, in which the inmates lay in rows, each with his feet towards the fire, and his head to the wall; the chief, or owner of the house, invariably takes the right side next the window, the place of honor; the next in point of rank occupy those nearest to him, whilst the slaves, and persons of no consequence, go to the furthest end. Their bedding (*wariki*), seldom consists of anything more than one or more ground mats (*waikawa*), upon which sometimes a finer one (*tihenga pora*) is laid, and a round log, or a bundle of fern serves as a pillow (*urunga*). Formerly they never ate in their houses, therefore verandahs (*mahau*) were required. The length of a whare puni is from twenty to thirty feet, and the breadth sixteen; the verandah is seldom more than six feet in depth, being a continuation of the gable end of the house, having the entire width[26] of the one building; it has a broad slab in front, about two feet and a half high, which separates it from the road; from this a post rises to the ridgepole which is surmounted with a caved figure.[27] [Figs. 27 and 28.] The verandah is ornamented in the same way as the interior of the house; its wall plate is often carved to represent the prostrate figures of slaves on whose bodies the pillars which support the house stand; this seems to refer to an extinct custom of killing human victims, and placing them in the holes made to receive the posts, that the house being founded in blood might stand; the custom still prevails in Borneo and other parts. Over the door is a board called *maihi* (also *pare* or *korupe*), elaborately carved, and adorned with bunches of pigeon feathers; the facings of the door-posts and window are similarly ornamented; the building is covered externally with raupo (*Typha angustifolia*) or sedge, and roofed with the same, then with grass or a similar substance, to a considerable thickness; earth is generally heaped up against the sides, so as almost to reach the eaves.

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[26] This is not quite exact, as the porch was always a little less than the width of the house. See Hamilton, p. 81.

[27] This post, which is common enough in modern houses, seems not to have been usual in those of the olden time. Fig. 25.

At sunset, a fire is made in the house, which is allowed to burn clear for some time, and fill the little pit with embers, when it ceases to smoke the occupants enter; the door and window being closed, the heat soon becomes almost as great as that of an oven, and of such a stifling nature, from the fumes of the charcoal, that few Europeans can bear it, yet frequently twenty, thirty, or more natives will sleep in this place huddled together, and almost in a state of nudity; sometimes even they suffer, from the charcoal being too powerful; this was formerly attributed to the visits of the *patupaiarehe* (fairies).

To the description of Maori dwellings must be added some account of their *pataka* or storehouse, a small structure on which the carver used all his art and industry. Being comparatively portable these pataka of the old Maori have mostly been gathered, either as a whole or in part, into museums and no longer add to the picturesque value of a native village. This small house, for it was merely a reduced model of the whare puni, was raised from the ground on one or more posts, and its general appearance may be understood by reference to Fig. 29, from a photograph of the beautiful specimen preserved in the Auckland Museum. When very small and raised high on a single post, the pataka resembled a bird-house and served as the depositary of a chief's bones which were in due time exhumed, cleaned and thus stored.

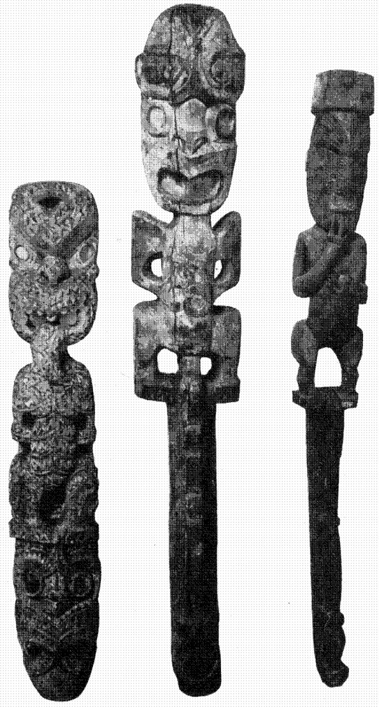

FIG. 28. GROUP OF GABLE IMAGES IN THE BISHOP MUSEUM.

The gable end of a pataka which was perforated by the very small entrance[28] was composed of five or seven thick planks usually of totara wood, on which were carved gods or deified ancestors of the owner, the figure over the door in the centre (Fig. 33) representing the chief ancestor, and the pantheon served to protect (under the tapu system) all treasures stored within, more than locks or human vigilance. These planks were bound to smaller posts intervening by cords of native flax (*Phormium*). As in the case of many, if not most Maori carvings really old, these figures represented facts which in Anglo-Saxon civilization are deemed indecencies, often so gross that they are not pictured by the foreign artist: to the Maori they did not so appear, nor do I believe they were made, as were many of the sculptures and paintings revealed by the excavations at Pompeii, to pander to mere sensuality. That they were often caricatures of realities is true, and such examples amused rather than in any other way disturbed the Maori.

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[28] Two of these pataka fronts in the Bishop Museum have doors averaging 22×17 inches. As they were reached by a ladder, it must have been very awkward to take bulky articles out. In some cases these pataka were built in shallow lakes and reached by boats.

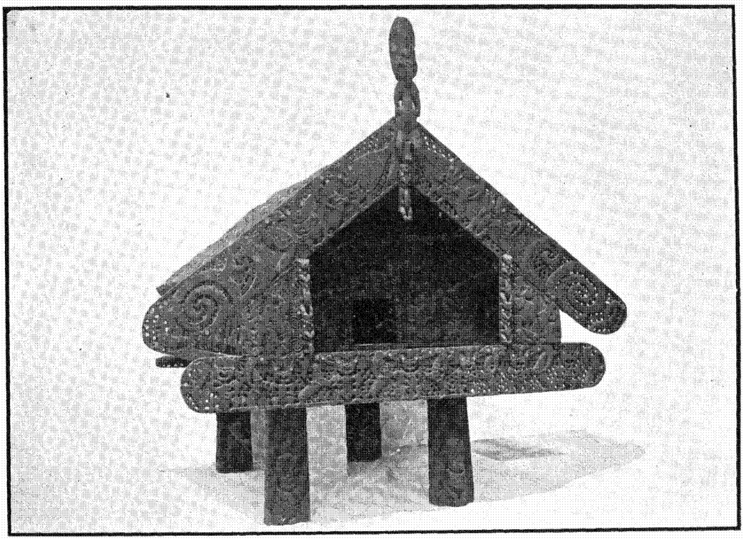

FIG. 29. PATAKA IN AUCKLAND MUSEUM.

In many Maori carvings of human or superhuman heads the eyes are represented by nacreous shell (*paua—Haliotis iris* and *H. stomatæformis*) cut in ring form and attached by a projection of the dark wood which represents the pupil. Bunches of feathers are also often attached to the cords tying the structure together.

The principal carvings, to recapitulate, that distinguish a Maori *Whare kopae* are, within the house the *poupou* or heavy carved slabs serving as posts, of which Fig. 30 one from the Rununga whare or Council house of the pa at Maketu, supposed to have been carved in 1820, and now in the Bishop Museum, gives a fair idea. These were generally memorials of the ancestors, human or divine, of the builder and not infrequently show a great amount of patient work. Even to the present day there are Maori skilled in this work, and with the white man's chisel the work is much lightened. Fig. 35. The principal post, *poutokomanawa*, supporting the ridge-pole, was carved in the lower portion in a more realistic way (see Fig. 32), and I have seen an outstretched hand from one of these figures that might have been the work of a competent European sculptor.

Externally the sculpture was expended on the gable front of these houses, as may be seen in several of the illustrations given. Of these the *amo*, of which a fine pair from Tarawera is shown in Pl. XXII, supported the lower end of the *maihi* or barge-boards; the latter supporting at the peak a figure, usually a mask (*koruru*), above which is the *tekoteko*. As shown in the illustration (Fig. 25) these images were of varied form, often grotesque, but always possessing some attributed power of protection, and so strong was this that the *tapu* often withheld the hand of the victorious enemy who had killed the inmates from disturbing the house; if the owners were all dead no one would despoil it even for firewood. Over the door was an elaborate carving called *pare* or *korupe*, one of which is shown in Pl. XXII. This rested on the *whakawae* or *ngawaewae*. The fancy of the Maori sculptor had free play on these lintels and they are among the most artistic Maori monuments in museums. Besides the one figured this Museum possesses another carved

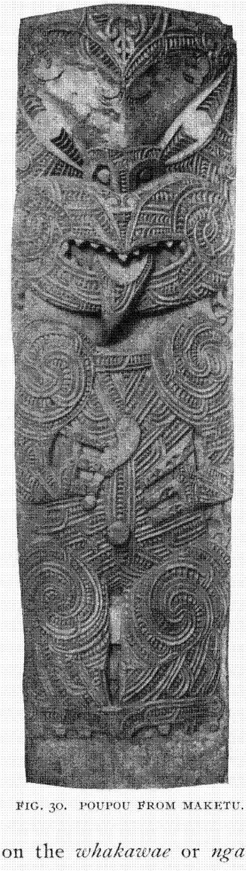
FIG. 30. POUPOU FROM MAKETU.

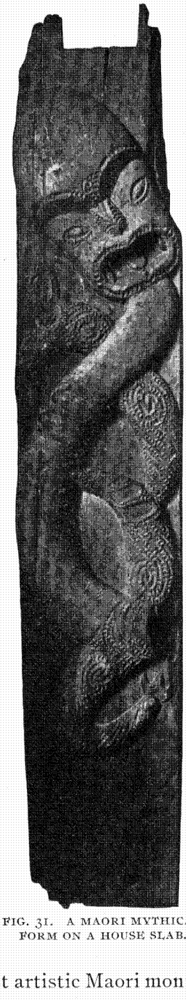
FIG. 31. A MAORI MYTHICAL FORM ON A HOUSE SLAB.

by the grandfather of Matangi, an old man in 1820. Thus dating from the time of Cook's visit, or perhaps earlier.

The ngawaewae were, in the old houses, very short; a fine pair in this Museum from Tetaheke, Lake Rotoiki, shown in Pl. XXII, measures only thirty inches in height, but with the advent of foreigners the height of the doorway increased, and modern carved ngawaewae are made high enough to accommodate a tall foreigner; one of these is shown in Fig. 26. In the modern work the old design, however, still appears, one figure upon another. The round bellies of the figures, the curious three-fingered hand, the fingers of one or the other hand inserted in the mouth, the mouth itself recalling the mouth of the Hawaiian idols, who also have the same oblique eye, all are repeated in most of the doorposts I have seen. A section of one of these ngawaewae is of L form, the figures occupying the short arm, while the longer one is decorated with Maori arabesques.

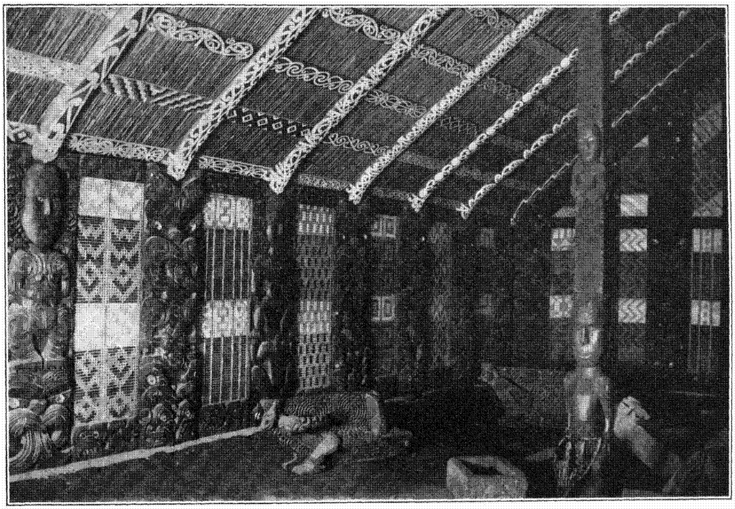

FIG. 32. INTERIOR OF MAORI HOUSE, ROTORUA.

In the fine doorway shown in Fig. 33 the same figures are at either side of the door. The main figure over the door has so large a head that the remarkable device of two necks does not seem unreasonable. In the Fig. 34, the central slab of a fine pataka in the Bishop Museum, the interlaced strap pattern of the ground is good even for old

Maori design. The main figure holds a *patu* in which is an English penny. The door has been fastened by an old English lock, of which the keyhole is seen on the right. While the human figures in Maori carving seem grotesque in the extreme, the mythical animals frequently found in sculptured decoration out-herod Herod. The Maori was well able to treat his subject *ad naturam*, and if he distorted the actual models before him, he had his reason, and it was not lack of power; but when his subject was a *taniwha* he perhaps

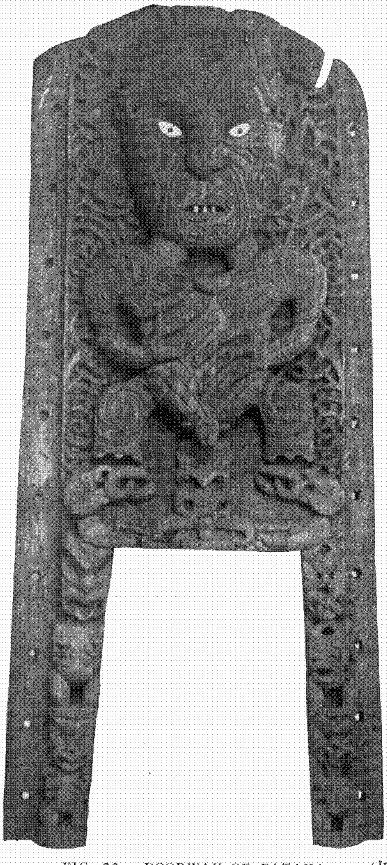

FIG. 33. DOORWAY OF PATAKA. (In the Bishop Museum.)

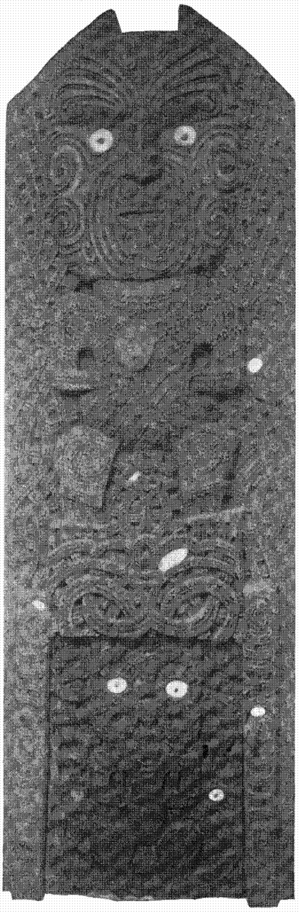

FIG. 34. CENTRAL SLAB OF PATAKA

came as near the idea as the Greek in his Chimæra or Hydra. The figure given in illustration (Fig. 31) is a remarkably fine bit of old carving, in private hands in Auckland, when I saw it a few years ago. Other carved slabs were found with it buried in a swamp, and on all the carving was of the highest order, although in some places decayed. The designs were often remarkably obscene to the Anglo-Saxon sense, although proper enough to the Maori.

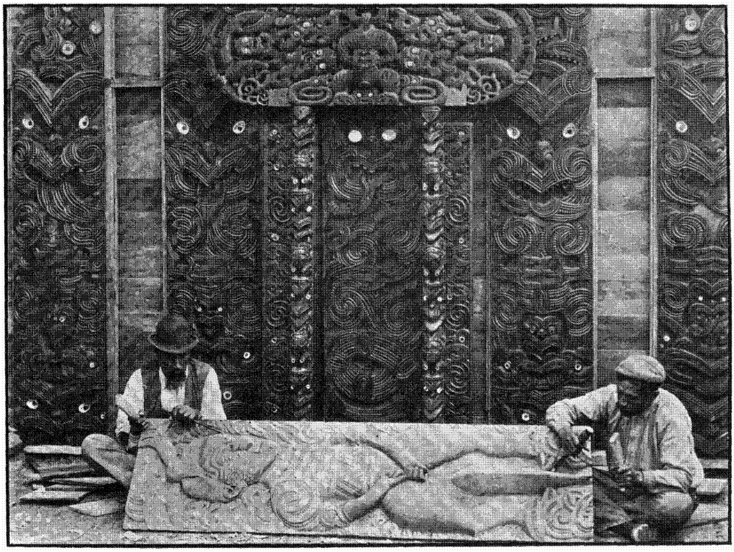

FIG. 35. NEW ZEALANDERS CARVING A POUPOU.

It may be repeated that the strange figures on the *poupou* or other parts of the Maori house represented ancestors, human or divine, of the owner of the house, and the faces bear the *moko* or carved face decoration which was distinct in each head, and cut on the living flesh much as the sculptor carved it on his block of wood. An old Maori could have told who the carved face portrayed from the pattern of the moko.

Union Group.—We may now return to the mid-Pacific, not far from Samoa, and between that group and the equator in about 9° S. lies the Union Group, consisting of the three low islands Atafu or Oatafu (Duke of York Id.), Nukunono (Duke of Clarence Id.) and Fakaafo (Bowditch). Byron, who discovered Atafu in 1765, reported it uninhabited. There are some sixty-three islets covered with coconut and pandanus trees, and the atoll is now under British protectorate as are the two others. Nukunono was discovered by Captain Edwards in the *Pandora* in 1791, and Fakaafo by Captain Hudson of the U. S. Exploring Expedition in 1840.

The houses on these islands at the time of the visit of the Exploring Expedition as we see them in the drawings of Mr. T. C. Agate, one of the artists of the expedition, are not only typical of the *stick and thatch* method of building, but very beautiful examples of that architecture now almost extinct in this region (Fig. 36). Captain Hudson visited a village on the shore of the lagoon and describes it as containing—

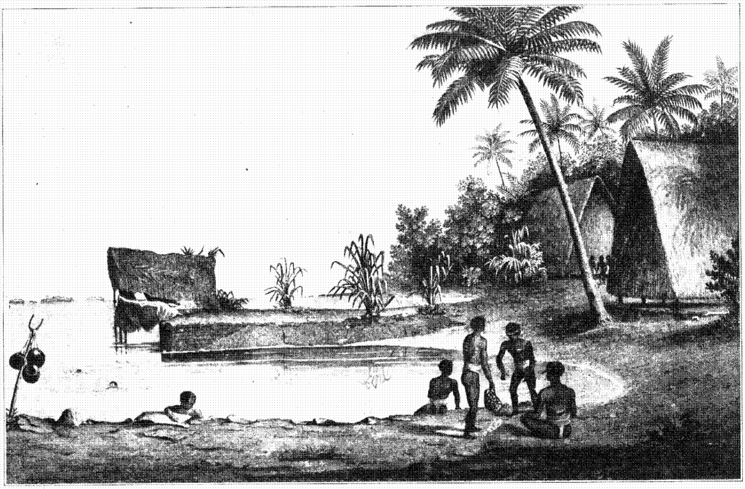

FIG. 36. SCENE ON ATAFU. DRAWN BY T. C. AGATE.

> ....about thirty houses which were raised about a foot above the surrounding earth; they were of oblong shape, about fifteen feet high to the ridge-pole, sloping gradually and of a convex form to within two or three feet of the ground; the roof [ridge-pole] was supported on high posts, whilst the lower part rested on short ones, three feet within the eaves having a strong piece extending around, on which the rafters were tied; the gable-ends were overtopped by the roof, and seemed necessary to protect them from the weather. Below the eaves the whole was open from the ground to the roof. The thatching, made of pandanus-leaves, was of great thickness, and put on loosely. The interior of the houses was very clean, but there was no furniture except a few gourds, and a reclining stool, cut from a solid block of wood, having two legs at one end, which inclined it at an angle of nearly forty-five degrees; to show the manner of lying in it, they imitated a careless

and comfortable lounge which they evidently considered a luxury. It was conjectured that they had removed their various household utensils to a secret place.

The most remarkable constructions of the islanders near the village, were three small quays, five or six feet wide and two feet above the water, forming slips about ten feet wide: at the end of each of these was a small house, built of pandanus leaves, partly on poles in the water [See Fig. 36]. * * * * * * They have no water on the island, and the supply is wholly obtained from excavations made in the body of the cocoanut trees, two feet from the ground. These trees are all dug out on the lea side, towards which all are more or less inclined. These excavations are capable of containing five or six gallons of water.[29]

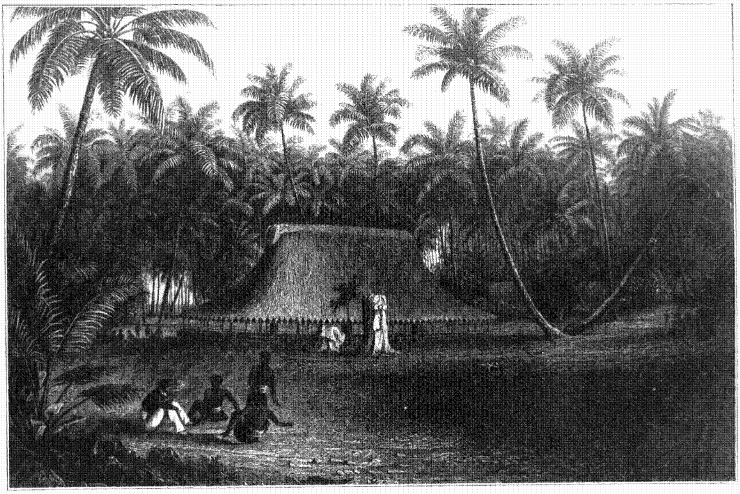

FIG. 37. COCONUT GROVE AND HOUSE ON FAKAAFO. AGATE.

The boats of the expedition were not able to land on Nukunono and sailed southward, discovering Fakaafo. On this new island they found the dwellings much like those they had seen on Atafu, but better built. Quoting again from the Narrative (v, p. 14):

> The most remarkable building was that which they said was their *tui tokelau* (house of their god). This stood in the centre, and was of an oblong shape, fifty by thirty-five feet, and about twenty feet in height. The roof was supported in the centre by three posts, two feet in diameter, while under the place on which the rafters rested, were many short and small posts: all were very roughly hewn, and placed only a few feet asunder. The roof was concave and extended beyond the posts at the eaves; the thatching was tied together, which, hanging down, resembled at a distance the curtain of a tent or marquee. All the sides were open, excepting a small railing, about fifteen inches high, around the foundation, which allowed the free passage of the air through. * * * *

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[29] U. S. Ex. Exped., v. 7. It is not probable that they had more furniture in their ordinary houses.

The edifice contained but little furniture. Around the eaves a row of mother-of-pearl shells was suspended, giving the appearance of a scolloped curtain. The whole was covered with mats. In the centre, around the largest pillar, a great number of enormous benches, or tables were piled, which were carved out of the solid wood, and being of rude workmanship, were clumsy and ill-shaped. In all probability these were the reclining stools before spoken of. The natives termed them "the seats of their god." Their gods, or idols, *tui tokelau*, were placed on the outside, near by. The largest of these was fourteen feet high and eighteen inches in diameter. This was covered or inveloped in mats and over all a narrow one was passed, shawl-fashion, and tied in a knot in front, with the ends hanging down [Fig. 37]. The smaller idol was of stone and four feet high, but only partially covered with mats. About ten feet in front of the idols was one of the hewn tables, which was hollowed out; it was four feet long by three broad, and the same in height. (Loc. cit., v, p. 14.)

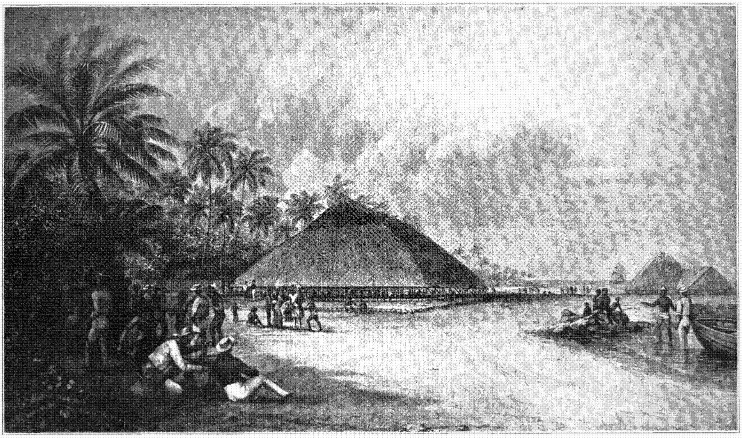

FIG. 38. LARGE MARIAPU AT UTEROA.

Gilbert Islands.—Turning northwestward from the Union Group, we soon enter the region of Micronesia,—the little islands, a vast archipelago stretching many degrees east and west along the equatorial belt and in a way connecting the southeastern Polynesians with the Asiatic races of the Marianas and Pelew Islands on the north of the equator, and through the spurs of the Seniavine and Mortlock groups, with the Papuans of the Bismarck Archipelago and the New Hebrides on the south. The islands of the Gilbert and Marshall groups are low coral atolls,—small islands grouped around a shallow lagoon, generally roughly circular, sometimes mere arcs of the circle remaining. The climate is equatorial throughout, and that and the vegetation and lay of the ground would conduce to uniformity in housebuilding. On Tapiteuea (Drummond), or rather its northern islet Uteroa, the Wilkes expedition landed and, unfortunately, later had to burn the village in punishment for the murder of one of their crew. Wilkes describes their building as follows, and Mr. Agate has given the picture of the principal building (Fig. 38):

> They reached the beach near what the natives termed their "*Mariapu*", or council house, one of the large buildings that had been before spoken of as visible from the sea. This stands in front of the town, on a broad wharf made of coral stones built out from the beach; its dimensions as measured were one hundred and twenty feet long, by forty-five feet wide, and to the ridge-pole forty feet high. The ridge-pole was supported by five large posts whence the roof sloped on each side and reached within three feet of the ground; the rafters descended to a wall-plate which rested on large blocks of white coral, and were also supported by smaller posts ten feet in length, near the sides. At the ends the roof was perpendicular for eight or ten feet, and then they sloped off in the same manner as the sides. The roof was thatched with pandanus leaves. (Loc. cit., v, p. 55.)

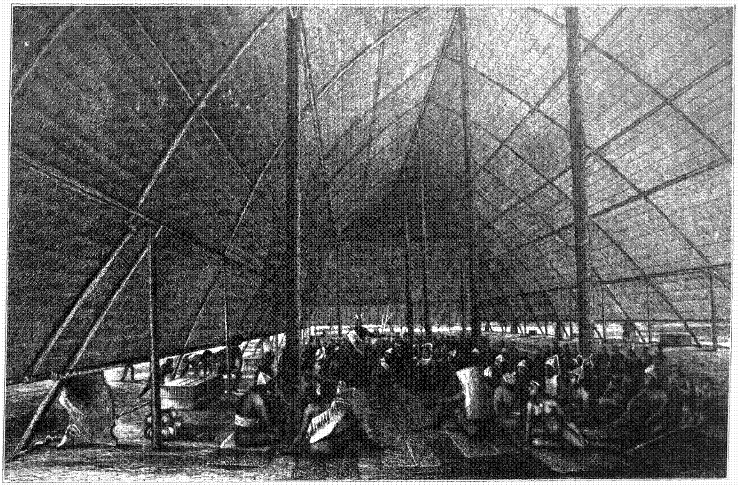

FIG. 39. INTERIOR OF MARIAPU.

> The Mariapu was a very large building, and in the interior [Fig. 39] its architecture showed to much advantage: the ridge-pole with the rafters, were painted in black bands, with points, and ornamented with a vast number of ovule shells. Chests made of the thin laths of the pandanus, somewhat resembling cane, were arranged around, about twenty feet apart: these contained only a few mats and cocoanuts, things of no value, and are supposed to be for the accommodation of visitors or used at their feasts. The floor was in places covered with mats of the cocoanut leaves [p. 59].

Near this was a dwelling of the better sort which they thus describe:

> There was nothing remarkable in its exterior; it was of oblong shape, and about sixteen feet wide by twenty feet long. The interior consisted of two stories, of which the lower one was not more than three feet high, under the floor of the upper story. It was entered by a square hole on one side.

The apartment above was rather a loft or garret, which was high and contained apparently all the valuables and goods of the occupant. The floor was made of small pieces of pandanus boards laid on slender beams of cocoanut wood. * * * * The lower apartment is used for sleeping, while the upper entirely for storing their goods and chattels. The wall-plates rest on four beams of cocoanut wood, which are supported by four posts at each corner. These posts are round and perfectly smooth so that the rats cannot climb them. The rafters and cross-pieces are mere poles only an inch or two thick; the thatch is of pandanus-leaf doubled over a slender stick and tied down with sennit. (p. 56.)

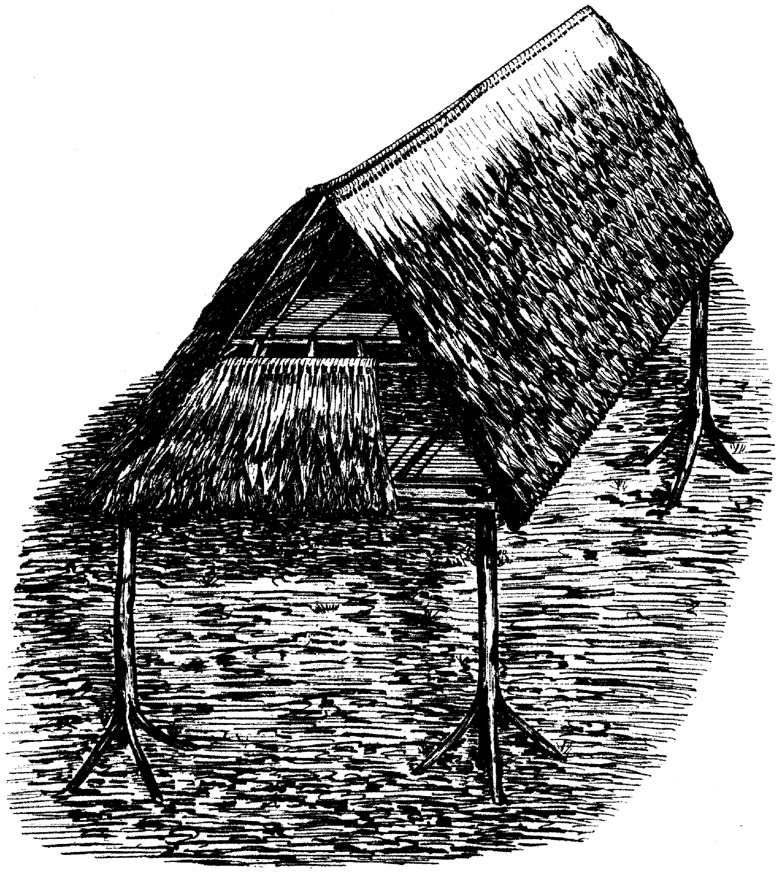

FIG. 40. MODEL OF A MAIANA HOUSE.

Here we have the first attic in the Pacific architecture; indeed the first suggestion of a second story. The upper beams used as shelves for various articles, in the Samoan, Tongan and Marquesan houses have now developed into a garret. From the island of Maiana we have in the Bishop Museum a carefully constructed model of a house (see Fig. 40) given by the Reverend William Lono, formerly a missionary of the Hawaiian Board to the Gilbert Islands, now the pastor of the Kaumakapili Church in Honolulu. In this we have a still farther developement. Like the houses of Tapeteuea it is supported on four smooth corner posts, probably for the same reason, but the first floor contains a room of ample height, with an opening in the floor of such extent as to place the remaining floor in the class of gallery. The entrance is through this aperture by a rude ladder,[30] which is removable, and there is no opening on the sides of the house on this story. The height of the first floor above the ground is quite sufficient to keep pigs and other intruding animals out. The floor aperture admits light, serves for ventilation, and the easy removal of rubbish. Above this is another gallery with a diminished opening in the centre, the floor of the attic store room. This is well ventilated at each gable, one, indeed being left open. There is a double ridge-pole as in the Hawaiian house.

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[30] Rev. Hiram Bingham D.D., who was for years a missionary in the Gilbert Islands, assures me that they seldom used ladders to get into the comparatively low floor.

Kusaie.—From the low islands of the Gilbert archipelago we turn to the high volcanic islands that appear here and there in Micronesia. Conditions having changed, the housebuilders have planned in other ways. The possession of stone (utterly wanting in the coral islands), again suggests the platform as a good house foundation, and the structure gaining in dignity, we find the houses of the chiefs and well-to-do men exhibiting some architectural features that we have not hitherto seen in our rapid sketch of Pacific house-building: as we go west we shall see more, and have perhaps all that the "stick and thatch" house can show.

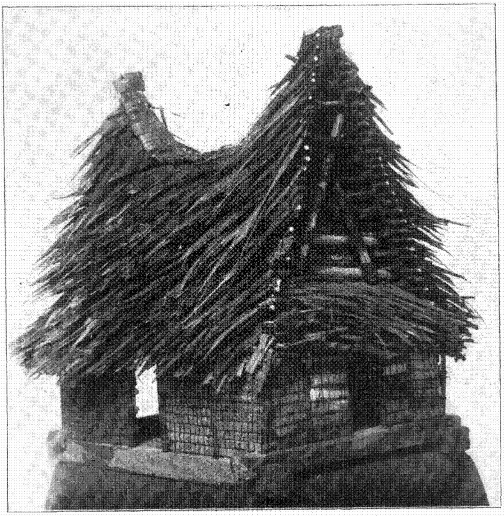

FIG. 41. MODEL OF A KUSAIAN CHIEF'S HOUSE.

In this Museum is a carefully made model of a Kusaian house (Fig. 41) belonging to a chief, which presents a square structure of which the saddle roof is the prominent feature. The walls of the house are, as usual, low and the framework is of squared timbers without cross bracing, the interspaces closed, not with thatch, but with neatly made mats of reeds closely bound together with sinnet, a light and cleanly method. These mats are colored white with lime made from coral, left in the natural color, or decorated with sennit. The four sides have each a small central door. The palm-thatched roof has the peculiar form shown in the figure, and the gable ends, partly open for ventilation, seem to be the most decorated portion of the building. Fig. 42 shows more of the detail, but the sennit patterns in red and black on a white ground should be seen in their fresh color to be justly appreciated. There is a lightness,

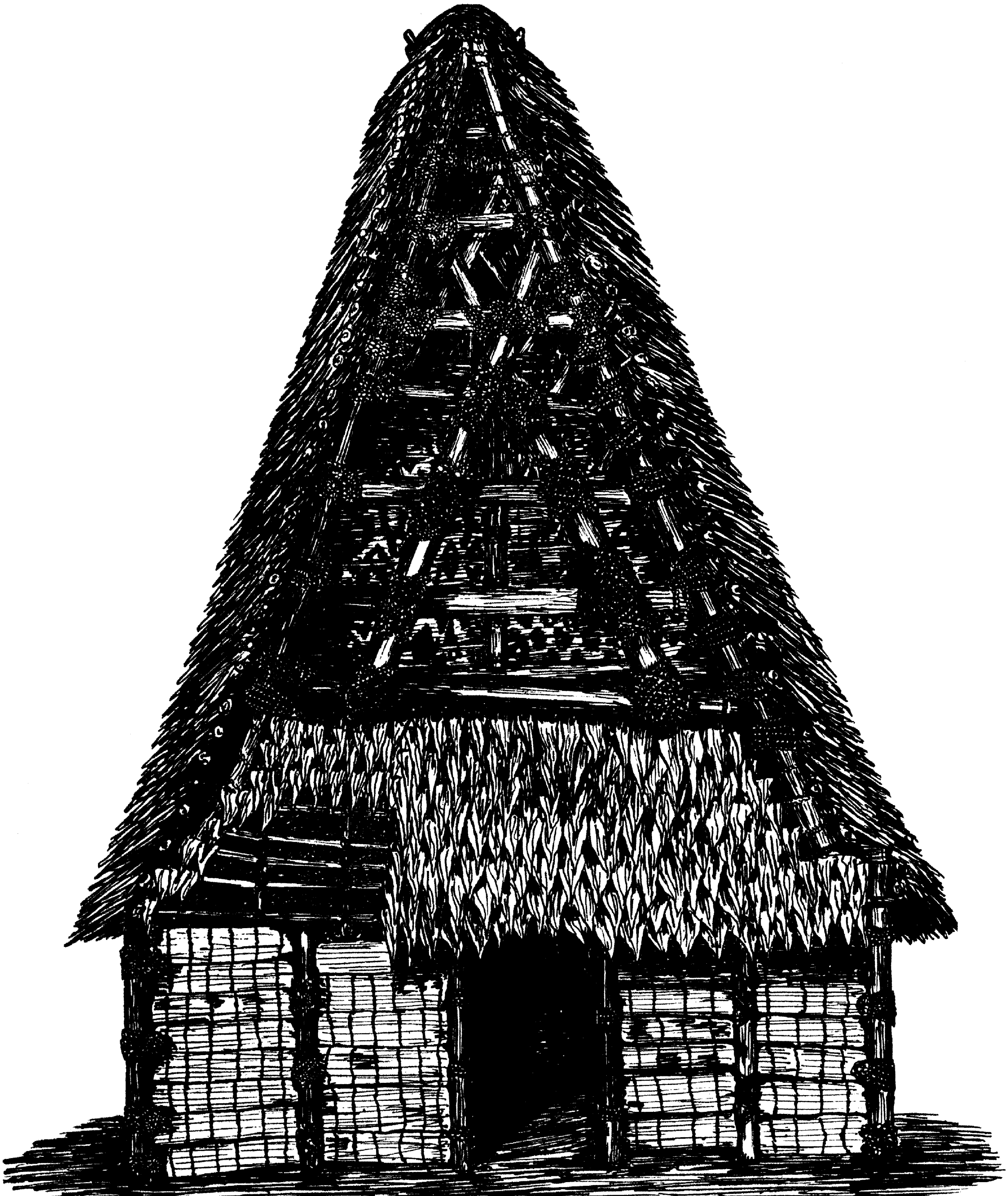

FIG. 42. GABLE OF A KUSAIAN HOUSE.

wanting in the Maori carved house, very attractive in the warmer climate of Kusaie. To these houses, which are of limited size, there are no internal beams and the ridgepole is supported by the triangles shown in the figure of the gable end. The floor is of slats, after the style of the East Indian bambu structures, and while light and cleanly, is hard for a novice to walk upon. Of the interior furnishing I have no particulars.

Ponape.—In Ponapé the houses are built upon platforms as in the Marquesas, Hawaii and elsewhere: and these substructures are four or five feet high, built of basaltic blocks or slabs of coral limestone. The house-walls are low; the beams of the framework squared, and the interspaces filled with panels or curtains composed of reeds or cane not more than half an inch thick, bound together neatly by coconut fibre: the roof is closely thatched with palm leaf, the eaves projecting so as to shade the walls. The narrow doors are a marked feature of these rectangular, shed-like dwellings, which are seldom more than twenty feet high to the ridges.

I pass over the stone structures on the shores of Ponapé, already referred to, because there does not seem sufficient evidence that they were built for human habitation, or if they were, have been more than foundation platforms for ordinary houses.

Pelew Islands.—The story of the happy island as edited by Keate[31] from the journals of Captain Wilson and his officers, pictures an Arcadia seldom met with and assuredly not to be found in the Pacific at the present day. The houses of the amiable people therein depicted are thus described:

> Their houses were raised about three feet from the ground, placed on large stones, which appeared as if cut from the quarry, being thick and oblong; on these pedestals the foundation beams laid, from whence spring the upright supports of their sides, which were crossed by other timbers grooved together and fastened by wooden pins; the intermediate spaces closely filled up with bamboos and palm-leaves, which they plaited so closely and artificially as to keep their habitations warm and exclude all wet; and their being raised from the ground preserved them from any humidity. The floors were in general made of very thick plank, a space of an inch or two being left between many of them. But in some of the houses they were composed of large bamboos split, which being perpetually trodden over, rendered them very slippery. The interior part of the house was without any division, the whole forming one great room. In general the fire-place stood about the middle of it, sunk lower than the floor, with no timber below it, the whole space beneath being filled up with hard rubbish; but in the larger buildings, where they held their public meetings, they had a fire-place at each end. Their fires were in common but small, being mostly used to boil their yams, and to keep up a little flame at night to clear away the dews, and smoke the mosquitoes. Their windows came to the level of the floor, and served both for doors and windows, having stepping-stones at all of them to enter by. To prevent any inconvenience from wind or rain, which so many apertures

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[31] An Account of the Pelew Islands situated in the Western part of the Pacific Ocean. Composed from the Journals and Communications of Captain Henry Wilson and some of his officers, who, in August, 1783, were there shipwrecked, in the Antelope, a Packet belonging to the Honourable East India Company, by George Keate, Esq., F. R. S. and S. A. London, 1788. 4to. (Second Edition.)

might occasion, each of them had a bamboo frame or shutter, interwoven as the sides of the house were, which sliding on bamboo rods, were easily slipt on one side when anybody wanted to go in or out. On the top of the upright sides beams were laid across from whence sprang the roof, which was pointed like our barns the whole inside being clear; this made their houses within very lofty and airy: the outside of the roof was thatched very thick and close with bamboos or palm-leaves. This was the general form of their houses; some of which were from sixty to eighty feet in length, but these were appropriated to public uses, such as meetings of business, or festivity; at other times they served the natives to assemble in and chat together, where the women usually brought their work and joined in the conversation. Those that were properly domestic habitations, were the same both in shape and texture, though less in dimension. It was remarked that the family kept on one side of the central fire-place, and the servants on the other.

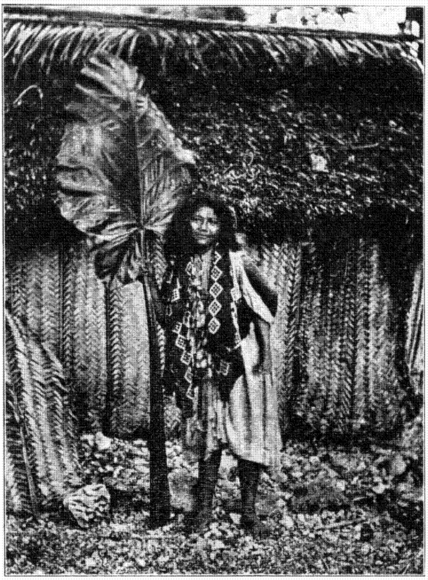

FIG. 43. WOVEN WALLS OF NIUE HOUSE.

From the same author we learn that the islanders had earthen vessels for boiling their yams, etc., bambu joints for water buckets, adzes of shell (*Tridacna gigas*) including the reversible form known from New Guinea to Hawaii (see these Memoirs, i, p. 419, fig. 85, pl. lx); tortoise-shell dishes and fish-hooks; knives of pearl shell as well as bambu. Their cords and nets were made of coconut fibre, they pinned their house frame together, an East Indian or Asiatic fashion, although pins were used in Maori houses, and in parts other than the main frame in Hawaii, instead of using the Polynesian method of tying with sennit. The almost universal bambu floor of Asiatic cottages, is found in occasional use.

An interesting variation in the walls of the thatched house is shown in Fig. 43, where the braided palm leaves are much closer knit than is usual in the Polynesian use of this leaf. The girl of Niue (Savage Id.) in the foreground is holding a leaf of the *apé*, a gigantic form of kalo.

New Guinea.—Sailing south from the Pelew group we come to the great island that we call New Guinea because there is no collective native name. Hostile tribes, many of them practically unknown to this day, speaking dialects mutually unintelligible, most of them cannibals ordinarily or on occasion, with Polynesian settlements dotted along the northern coast, and with dialects almost as many as the villages, small wonder that the architecture seems fantastic and subject to no rule! Pile dwellings built out from the marshy shore, much as the lake dwellers of central Europe built six thousand years ago; tree dwellings high up in the free growing trees of a tropical climate, and between these extremes almost every light and flimsy pattern of house building, from the hut hardly large enough to shelter a single specimen of the naked people of the Papuan race, to the communal house several hundred feet long gathering beneath its huge roof people enough to fill a good sized village—as New Guinea villages go. We could fill a scrap book with pictures of the bizarre structures the explorer meets, but it would be only a scrap book, and we must be content with a bit here and there seen much as a bird may be supposed to see houses in rapid flight.

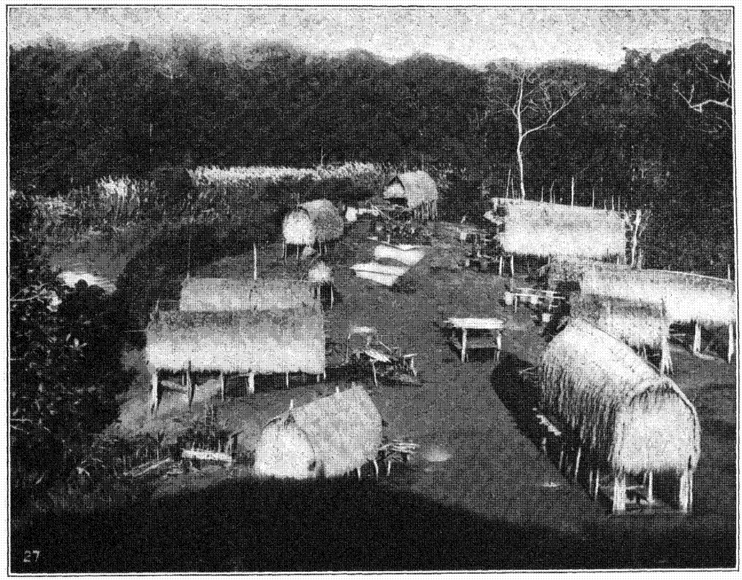

FIG. 44. NEW GUINEA VILLAGE.

Even if we knew all about the ways of construction, the materials used and the necessities governing the final result, this would not be the place to enlarge upon the subject which might fill volumes. We can only glance here and there, with the aid of photographs, of which there are many more at hand than there are memoranda of material or actual uses of the pictured dwellings, for almost all explorers of the present time go provided with cameras, and bring back good or at least interesting results, some of which I am still to present here. I will be as brief as possible, for I am impatient to come to my chief subject, the housebuilding of the old Hawaiians, and I have not the privilege of turning over the pages until I come to desired matter, as my readers have.

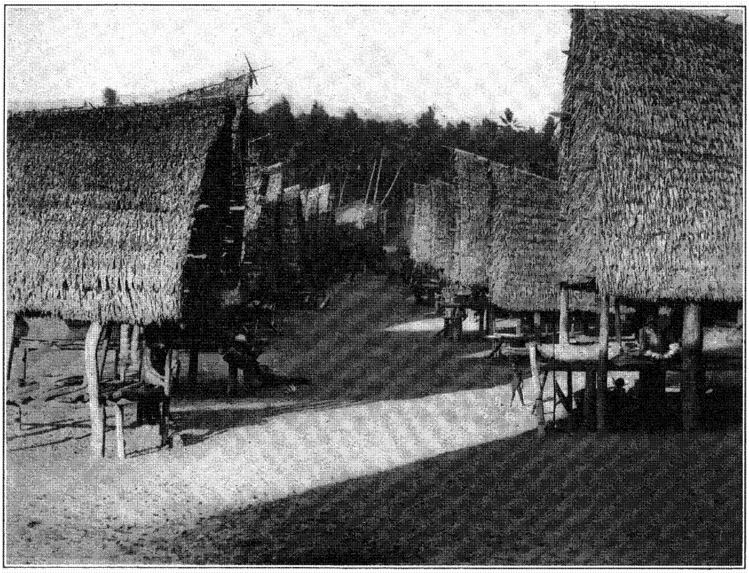

FIG. 45. A VILLAGE STREET IN NEW GUINEA.

First the pile dwellings: many have been the discussions as to the why of this very ancient method of establishing one's house, but it is fair to suppose that not one rule applied to all the races in widely separated parts of the earth, and whether it was protection from enemies, human or animal, or the more insidious but not less deadly forces arising from a marshy country, or merely convenience for a boating and fishing race, and for the scavenging needs of humanity, we care not now; we have merely to recount the fact and manner of these Pacific pile dwellings (which, as we shall see, are not confined to damp or watery regions).

There are many ancient voyages, especially among the Dutch, that give us accounts of the pile villages more or less distinct, but we may pass them by, for the men of New Guinea still build in many places precisely as did their remote ancestors. It is to be noted that as the scale of humanity descends many characteristics of what was once considered the peculiar property of animals, instinct, appear in human works; early habitations differed little for many generations, but resembled their archetype almost as closely as the cell of the honey bee in our modern hives resembles that of Hybla's honey-maker. I shall, however, quote from Dumont D'Urville,[32] who, three quarters of a century ago, gave his readers a glimpse of one of these villages on Geelvink Bay, off Dorei in the northwestern part of Dutch New Guinea:

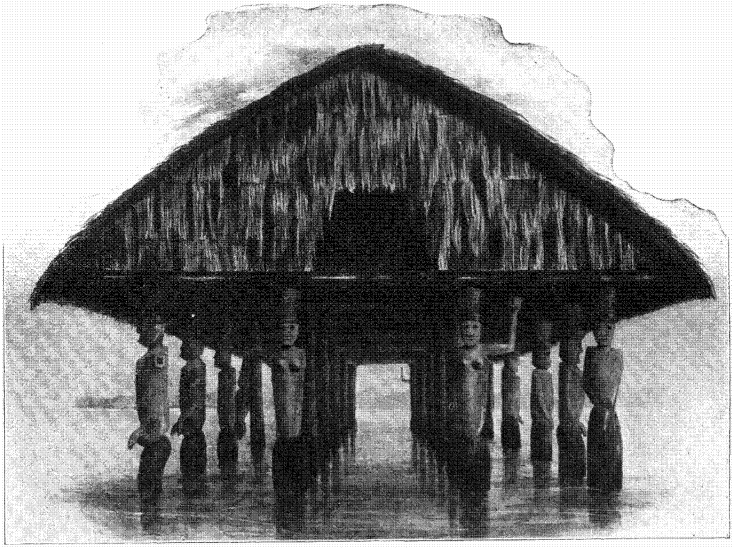

FIG. 46. SACRED HOUSE AT DOREI, D'URVILLE.

> Chaque village renferme de huit à quinze maisons établies sur des pieux : mais chaque maison se compose d'une rangée de cellules distinctes, et reçoit plusieurs familles : Quelques-unes de ces maisons contiennent une double rangée, de cellules séparées par une couloir que régne dans toute leur étendue. Ces édifices, entièrement construits en bois grossièrement travaillé sont percés de toutes parts à jour et branlent souvent sous les pas du voyageur.

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[32] Voyage de la corvette L'Astrolabe exécuté par ordre du Roi pendant les années 1826-1829 sous le commandment de M. J. Dumont D'Urville, Capitaine de Vaisseau. Histoire du Voyage, Tome Quatrième p. 607. Paris, 1830-33.

This author also gives a remarkable plate of a sacred house at Dorei built on carved piles over the water, but gives no sufficient description. The portion of the plate showing the house is reproduced in Fig. 46. I am informed, however, by a recent traveler[33] that this house no longer exists.

I turn now to the opposite end of New Guinea, and quote as my authority a man who has done much to increase our knowledge, not only of that part of the great island geographically, but has intimately known the people whom he went to teach, Reverend J. Chalmers. I met Mr. Chalmers (Tamate, as the natives affectionately termed him) in Sydney a short time before his martyrdom at the hands of a cannibal tribe, who knew not their true friend, and I was much impressed with his modest sincerity and great knowledge of his people. He has written all too little, but in one of his later writings[34] we find:

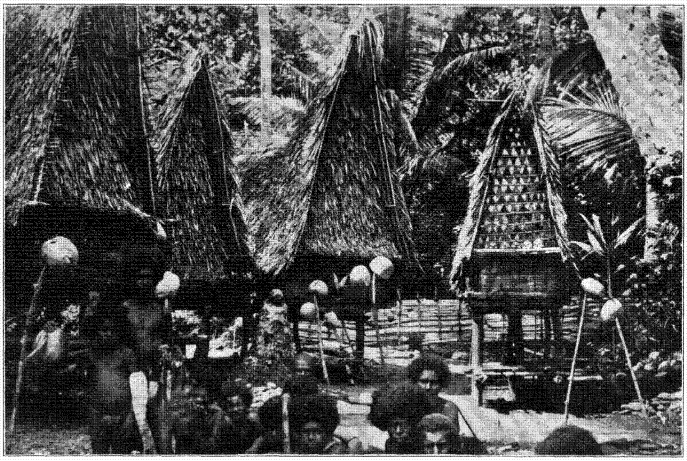

FIG. 47. VILLAGE ON DUAU.

> Early in the afternoon, after passing the river Vailala, we anchored at Kaili, twenty-two miles from Port Moresby, with 450 inhabitants. Kaili is charmingly situated at the head of a spacious bay. This is the second entirely marine village I have visited. It consists of fifty houses built on long poles in shallow water. There are four rows of these dwellings, the teacher's being the last. The church which stands apart between two rows, is connected with Reboama's [the teacher]. The road to church is merely one row of poles stuck in the sea, cross-sticks connecting the sacred edifice

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[33] Mr. Thomas Barbour, who has made many important observations in that region.

[34] Work and Adventure in New Guinea. J. Chalmers and W. Wyatt Gill. London, 1885.

with the first row of aerial dwellings. It must be a ticklish thing to walk to church by such a road. There is no communication between the other rows except by canoes or swimming.

We entered one or two curious dwellings. Their valuables consisted of grass petticoats, armlets, spears, clubs, axes and nets, with a few earthenware pots for cooking. The only reason assigned for erecting these marine villages is fear of their inland foes, and that their fathers did so before them. The church, like all other dwellings at Kaili, is a frail construction of sticks, sides and roof thatched with sago palm leaf. It is spacious, but has neither pulpit nor seats. As we paced up and down inside, it gently swayed to and fro in the breeze. These sea-villages have one obvious advantage over those built ashore—they are free from mosquitoes.

Passing on our way eastward, we saw a number of old piles, indicating the original site of Kaili before they were driven away by the Manukolo. Later on we anchored at the village of Kapakapa, consisting in truth of two hamlets half a mile apart, thirty-three miles east of Port Moresby. This is my third Swiss-lake-like village in New Guinea. It has a population of 450. Ioane, a native of Savage Island (Niue), is their teacher. I was struck with a hut standing apart from all others in the middle of the bay, and learned that it was built by a man who had quarrelled with all his friends! Fowls and hogs are fed and evidently thrive, in these remarkable dwellings. Our boat was pulled between the rows of dwellings, Mr. Chalmers occasionally throwing a handful of small pieces of tobacco into the sea. Men, women and children all dived down for that coveted prize, and in a friendly way contended for it. After dark on the same eventful day, Captain Liljeblad succeeded in making Hula, a distance of fifty-two miles from Port Moresby.

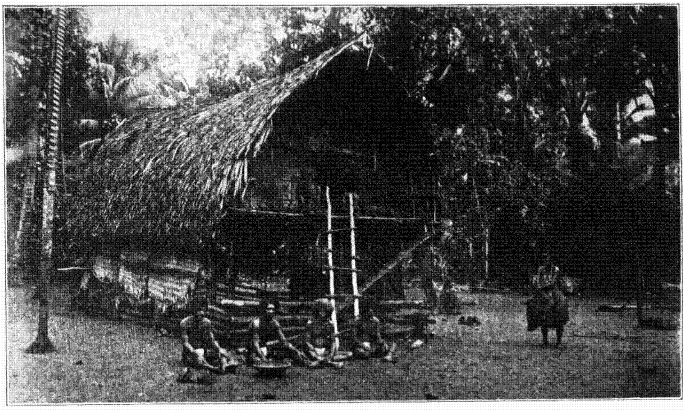

FIG. 48. HOUSE IN MILNE BAY.

Hula, like Tupuselei, Kaili, and Kapakapa, is built in the sea. It contains about 600 people. With our clerical friend I went in a canoe, through this long village, or rather two villages. Wishing to look at some of their houses, we climbed—not without some difficulty—up onto a platform ten feet above the sea. On this wretchedly insecure place they dance every night by torchlight. By day the younger members of the family sit and smoke there, regardless of the hot sun. Beyond is a shaded place for the parents. Climbing up a short ladder, you enter by a small door into their only sleeping apartment, which is very dark. A portion of it, however, is marked off; here the daily cooking is done, the accumulated ashes preventing the house from catching fire. The flooring is made from the sides of old canoes well adzed and secured to the framework of the house by rattan cane. One would surmise that their bones would be sore with lying through the night on bare boards: such, however, is not the case. Their ornaments and petticoats, weapons and chatties, hooks, lines and seines, are all in their proper places. The thatch is either of sago or nipa-palm leaf. All along, outside the ridging, sprouting cocoanuts are kept ready for use. Ornaments occasionally dangle from the extremity over the doorway. I noticed everywhere small oysters adhering to that part of the mangrove which is submerged: these become poisonous through contact with the mangrove.

Each dwelling in Hula is connected with the next by means of a single loose plank. A rail sometimes assists the hand in steadying the body of the adventurous traveller. It was interesting to observe how *they* ran from one house to another in perfect safety. We too achieved the feat, not, however, without fear of getting a ducking.[35] [Loc. cit., p. 281 et seq.]

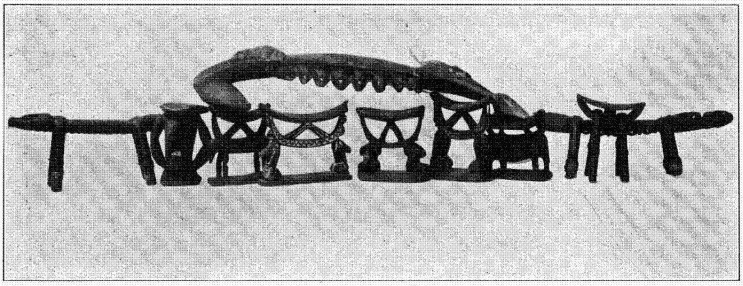

FIG. 49. NEW GUINEA PILLOWS.

Kerepunu is a magnificent place, and its people are very fine-looking. It is one large town of seven districts, with fine houses, all arranged in streets, crotons and other plants growing about, and cockatoos perching in front of nearly every house. [P. 40.]

The brief glimpse of Kerepunu, a village on the mainland, shows that the love of ornamentation, a strong trait of the Papuan race, there materialized in ornamental plants and birds, the former a difficult thing to manage about houses perched over the sea. The houses themselves, as everywhere in New Guinea, are still on piles. The tree houses, to which we shall come presently, are only built on gigantic, living piles. To return to our missionary leader who has sailed from the mainland some twenty miles to Wari (Teste of D'Urville) a small island where the natives make great use of human bone in their rather unpleasant ornamentation, and he thus describes their houses:

Their houses are built on poles, and are shaped like a canoe turned bottom upwards, others like one in the water. They ornament their houses on the outside with cocoanuts and shells. The nabobs of the place had skulls on the posts of their houses, which they said belonged to the enemies they had killed and eaten. One skull was very much fractured; they told us it was done with a stone axe, and showed us how they used these weapons. [P. 42.]

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[35] I had a good photograph of one of these pile villages but it has been misplaced, and a friend who promised me others to replace it has not yet fulfilled his promise; so I must ask my reader to imagine one of the ordinary villages built on land but still on piles, to be in a season of flooding, for the construction of the houses is much the same.

All through the Pacific there is a close relationship between men and pigs, not merely social but religious. In Hawaii not only was the pig a domestic pet, frequently taking the child's place at the human mother's breast, but when the poor relics of humanity were placed on the altar as a sacrifice to the gods the pig almost invariably accompanied them, the order of immolation being first a layer of pigs, then of human bodies face downward, and a repetition of this until the pile was complete. In this group also the vicarious sacrifice for a man was a black pig, a white cock and a red fish. The connection was not confined to the Polynesian race, but was quite as strong among the darker-skinned races of the Great Ocean. In the Aroma district of New Guinea, Chalmers tells us:

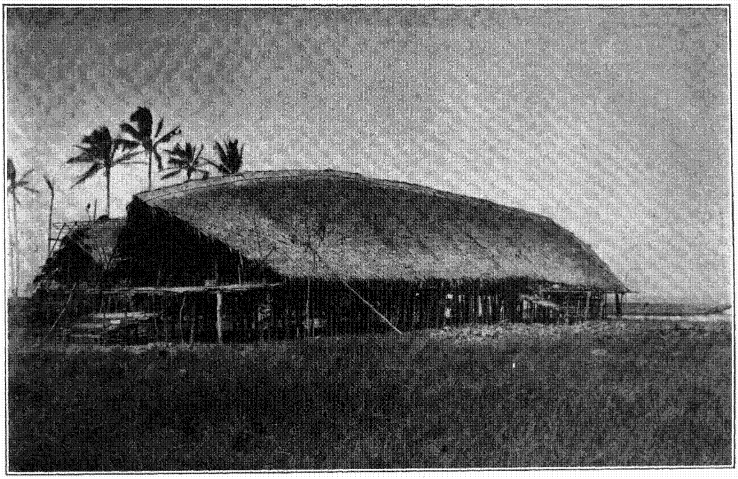

FIG. 50. LONG HOUSE IN NEW GUINEA.

> Pigs' skulls are kept and hung up in the house. Food for a feast, such as at house-building, is placed near the post where the skulls hang, and a prayer is said. When the centre post is put up, the spirits have wallaby, fish and bananas presented to them, and they are besought to keep that house always full of food, and that it may not fall when the wind is strong. [P. 84.]

Compare the centre-post of the Maori whare. From the same authority we read:

> When they go on trading expeditions, they present their food to the spirits at the centre-post of the house, and ask the spirits to go before them and prepare the people, so that the trading may be prosperous. [P. 85.]

The illustration of the village on Duau (Normanby Island of the D'Entrecasteaux group), Fig. 47, shows both the coconut decoration of these Papuan houses and also the human skulls, five of which appear on the horizontal bar across the gable of the house on the extreme right of the picture. It is probable that the coconuts are a modern substitute for skull, which they certainly resemble, and in some remote villages this substitute has not yet obtained. No worse, my readers, than the ancient customs on Temple Bar and many a city or castle gate in England! Generally trophies of conquest, in some places the skulls are the relics of dear relations. Chalmers tells of a widow who carried about with her in a small basket the skull of her dead husband, and as this husband had five wives, three inferior ones had the finger, toe, and other small bones drilled and strung as necklaces, while the fifth widow wore only his hair (p. 290). Different from the Hawaiian and Fijian who buried the bony relics, at least those connected with house consecration, here they are all above ground and in the light of day. The neat construction may be noted in the illustration. On piles, though not in the water, the ground plan is a narrow oblong and the roof is exceeding steep, out of all proportion to the walls of the house. The gable ends overhang the thatched walls which may be plain or decorated.

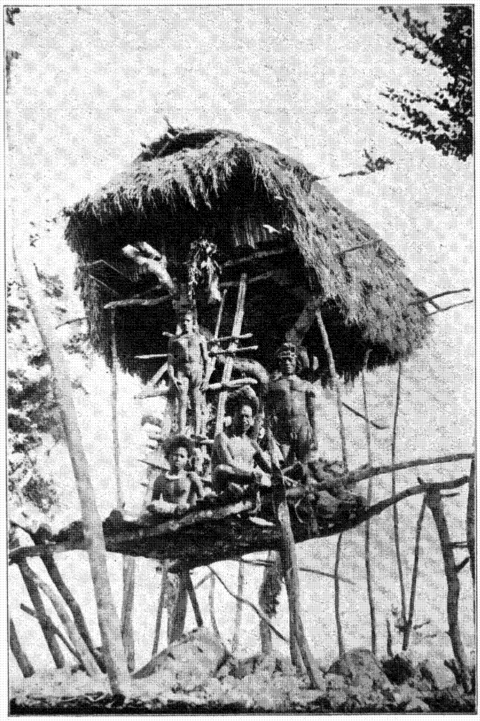

FIG. 51. A TREE HOUSE IN NEW GUINEA.

In the house in Milne Bay, shown in Fig. 48, the roof is more barrel-shaped, and covers a platform or verandah to which access is had both by a direct ladder and an inclined plank. The basement is fenced to keep out animals, and mostly closed in with mats. The household work is generally done out of doors, or in wet weather beneath the house, which, like the Hawaiian, serves mainly for sleeping purposes. We have given illustrations of the Samoan, Tongan and Fijian pillows, and it is well to give the fantastic forms affected by the Papuan of New Guinea, for these articles, as on the other groups mentioned, form with the sleeping mats one of the most universal and important portions of the house furniture, where the house is chiefly a sleeping apartment, and in New Guinea they curiously correspond with the fantastic designs of the houses. The animal form is everywhere noteworthy (Fig. 49), from the antediluvian reptile on the top of the row to the nondescript figure second from the left extreme. Like those already figured these pillows are for the neck and not the head, whose curious capillary dressing would be greatly disturbed by an ordinary pillow. Most of these pillows are from eastern New Guinea and the adjacent islands.

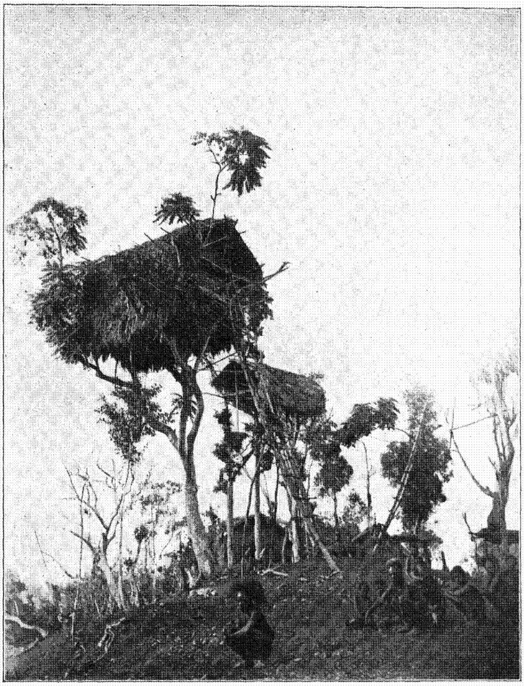

FIG. 52. TREE HOUSES IN NEW GUINEA.

Chalmers gives us so much information, often in unexpected places, that I am compelled to quote from him, picking up bits here and there. At Maiwa, on the Gulf of Papua:

> They have good large houses, kept wonderfully clean, with sleeping benches in all of them. In front of many of the houses are nicely kept flower gardens. The largest houses are built to represent an alligator with open mouth: the platform in front of the house is the lower jaw, and the long shade over the platform the upper, so that standing on the platform you stand in the alligator's mouth, the house sloping to appear as a body. One house, to be used as a temple in one of the inland vil-

lages, was about 150 feet long, very high, with carved posts, and in front overhead a beautifully decorated shade, with long pendants of different kinds of leaves. [P. 135.]

The centre post in every house is sacred to Kaevakuku, and her portion of food in every feast is first offered there. The first fruits belong to her. [P. 152.]

Their dwellings, as everywhere else in New Guinea, are built on piles about eight or ten feet above the ground. They are substantially built, but singularly arched. The house of each chief is furnished with a platform, about two feet from the ground, covered with a handsome cupola, but open at the sides, and floored with split bamboo. Here the men meet to discuss their tribal affairs. Between the houses are small enclosures of young areca palms, betel-pepper plants, variegated crotons, red cordylines and other shrubs. [P. 273.] The thatch used for the roof and sides of their houses is the leaf of the sago palm, which is not (as in Polynesia) sewn on to the small rafters, but pressed down firmly by long poles secured to the framework of the house. [P. 274.]

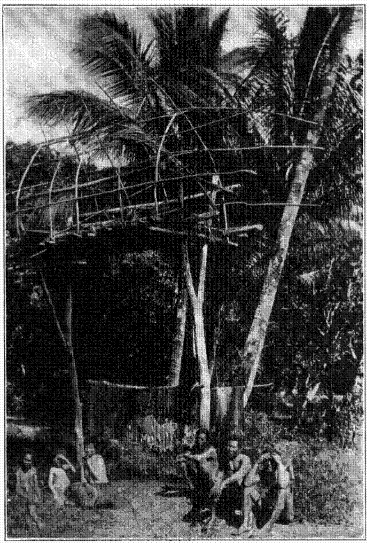
FIG. 53. CLUB HOUSE FOR YOUNG MEN.

From the dead piles to the living tree seems not a long step, and we find all along the New Guinea coast illustrations of this habitation. The one represented in Fig. 51 is not one of the highest, but shows the general construction better than any view that I have in my collection, and marks the transition from pile to tree. In this case the tree or trees, no longer living, serve merely to raise the house above the position of convenient attack; the house is well built and skilfully balanced on its supports, while the lower platform serves for a cooking place or a general rendezvous. The frame of a similar structure intended for a Dubu or club house for young men is shown in Fig. 53. In this case the elevated position of the building seems not so much for protection as for privacy.

I have referred to the communal house, common enough in this region, and a picture is given in Fig. 50. It is a long, barn-like structure, imposing by its size rather than by any grace of architecture. Perhaps the more common mode of entrance is at the ends, where the doors at either end are connected by a long passage from which the many apartments open on both sides. A family occupies one or more rooms, and the privacy is reasonably observed: each has its own hearth and provides its own food. I have not seen any statement as to the course pursued in building or keeping in repair this large habitation. Communal houses are common in the East Indies. See also, for the entrance, Plates XXIV and XXV.

Kiriwina Group.—The Kiriwina or Trobriand group lies southeast from New Guinea and seems in some measure a prolongation of the great island. In curious forms of dwellings it rivals New Guinea, although the population of the principal island, Kiriwina, is largely Polynesian. The houses, as may be seen in Figs. 54 and 55, are mostly roof. In the former illustration there is a little basement, slight vertical curve in the roof, and two end doors: while the whole gable end is of ornamental construction like those on Kusaie. So narrow is the house that, judging by the human figure in the foreground, a man could hardly lie across the floor. The gable of the house on the left shows the texture of the projecting roof, and there seems a distinct basement as well as an elevated platform. The whole scene has the effect of a stage setting. In the second illustration the horizontal curvature of the roof is well shown, as well as the careful ridge-covering. The gable ends seem imperforate and are not thatched, so that the house proper must be very dark and probably used only for bedroom, like most Polynesian houses. The house on the left seems to have a roomy but unoccupied basement, while that on the right has a distinct porch protected by a light roof. All the houses are placed in a close grove of coconuts which may partly account for their narrow ground plan. I cannot trace in the few photographs in my collection any connection with the general Polynesian house, but explorations are needed sorely in all this region to clear up the connection of the Polynesian inhabi-

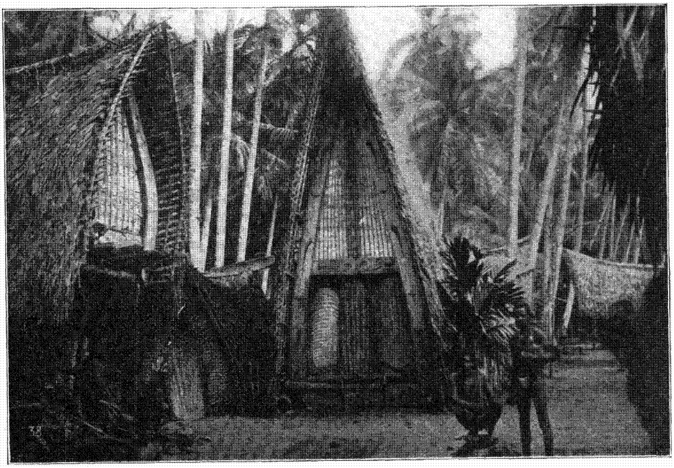

FIG. 54. HOUSE FRONT IN KIRIWINA.

tants, said to number many thousand, with their brethren to the eastward. It is too true that this entire archipelago has been strangely neglected by scientific explorers. As the two pictures which I present were taken in recent years, although I cannot fix the exact date, it is evident that modern and foreign changes have not made much headway, and doubtless much remains of the olden time.

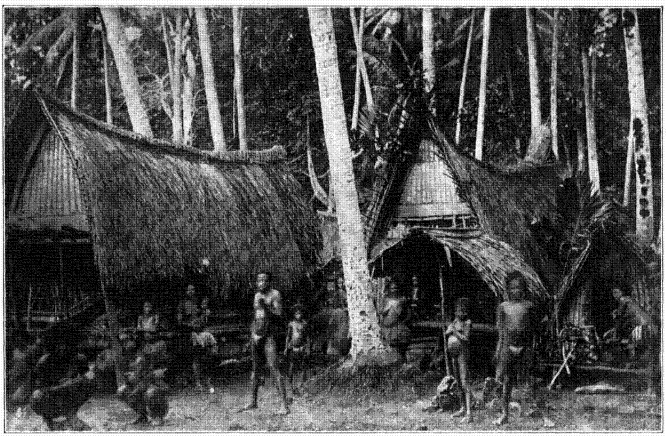

FIG. 55. A KIRIWINA VILLAGE.

New Hebrides.—Passing to another group of Papuan cannibals (for however much the missionaries have done to eradicate this great stumbling block to timid explorers, there are many left who enjoy a feast on their fellow men, not merely at their fellow men's expense) we have some very interesting records from the camera of the Reverend J. H. Lawrie, for some time a missionary in this region, through whose kind introduction to residents of the group I owe much of my information about the New Hebrideans and a collection of many of the least known objects of their manufacture. Three of the photographs of Mr. Lawrie, Figs. 56-58, show a low type of hut of the rudest construction (Fig. 56) hardly as neatly built as a skilled woodman would build his temporary camp. When, however, the fact that these people are very dirty is considered, the flimsy nature of their habitations, by no means so well built as most birds' nests, may be advantageous for a more ready purification by fire. As the people become more civilized and consequently cleaner, the house shares in the change (Fig. 57), and although the thatching is still rude, there is a greatly improved plaited reed front and definite doorway.

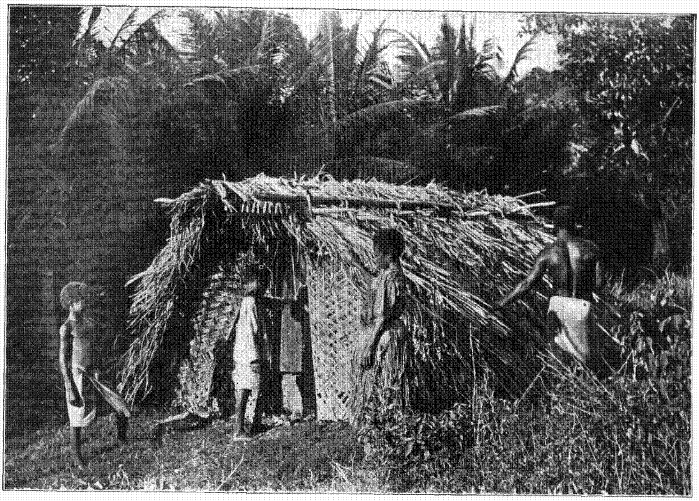

FIG. 56. ORIGINAL TYPE OF ANEITEUM HUT.

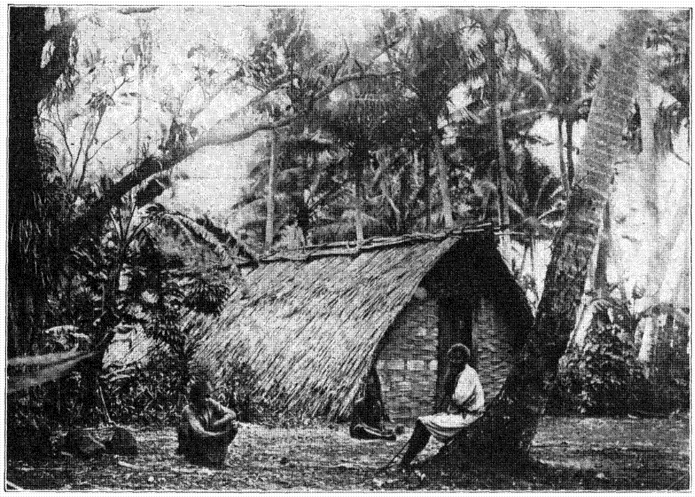

FIG. 57. ANEITEUM HUT WITH REED FRONT.

On the island of Malekula (Mallicolo) the form is very similar, and has a certain resemblance to the ruder of the Hawaiian grass houses. The people of this island are perhaps the worst cannibals in the New Hebrides, but their appetites do not seem to have improved their condition,—whether from the poor quality of their food, or their own insusceptible nature, cannot easily be determined. They are a people small in stature, light in bone, and with remarkably prognathous jaws, a low type. A little farther in the onset of foreign influences and the front is made of boards and utterly loses its native interest. This process of "amelioration" has already destroyed the houses of the aborigines and substituted throughout much of the Pacific region, nondescript sheds.

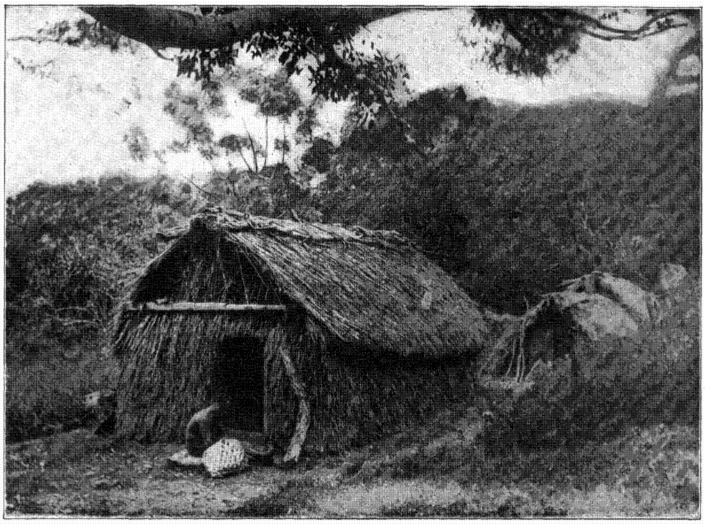

FIG. 58. VILLAGE IN MALEKULA.

The rude framing and coarse thatch are well shown in Mr. Lawrie's picture of house thatching on, I believe, the island of Tanna. The neighboring buildings look very modern, but there is no mistaking the native work, and primitive work, on the house in process of construction. Fig. 59.

When we consider that Nitendi, of the Santa Cruz group in the New Hebrides, was discovered by Mendaña in 1595, and was the seat of that miserable attempt at colonization where the same year the Spanish discoverer died, and for many years this archipelago has been a field for attempts at colonization by the French, it is surprising that so much still remains unaltered by grafted customs and fashions; that we have anything to call aboriginal. Plate XXIII shows two forms of rude hut on Santo.

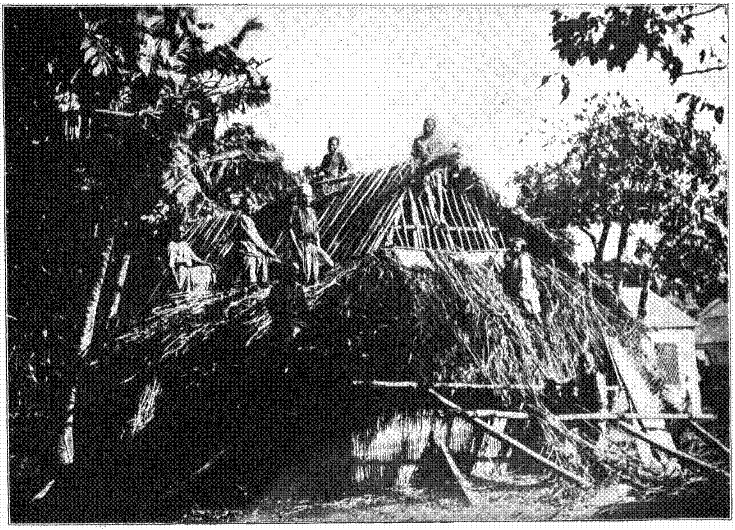

FIG. 59. THATCHING A HOUSE IN THE NEW HEBRIDES.

New Caledonia.—Passing for a moment the Solomon Islands, also a discovery of Mendaña on a previous voyage, we must notice the curious and divergent houses of the French colony of New Caledonia. In the voyage of D'Entrecasteaux in search of La Pérouse is the most detailed account of the houses of the New Caledonians, but the illustration is poor and the description too imperfect to show much more than that the modern habitations of these people are essentially the same that existed four generations ago: a circular hut with a conical roof without terminal ornament (see Cook, below), covered on both sides and roof with grass thatch, and with fairly high door, of which the jambs are often decorated with carving. Cook gives us the better account, in fact the best we have of the New Caledonian houses of the olden time, before foreign fashions had affected them (Second Voyage, II, 121):

Their houses, or at least most of them, are circular: something like a beehive, and full as close and warm. The entrance is by a small door, or long square hole, just big enough to admit a man bent double. The side walls are about four feet and a half high; but the roof is lofty, and peaked to a point at the top; above which is a post, or stick of wood, which is generally ornamented either with carving or shells or both. The framing is of small spars, reeds, etc., and both sides and roof are thick and close covered with thatch, made of coarse long grass. In the inside of the house are set up posts, to which cross spars are fastened, and platforms made, for the conveniency of laying anything on. Some houses have two floors, one above the other. The floor is laid with dry grass, and, here and there, mats are spread, for the principal people to sleep or sit on. In most of them we found two fire-places, and commonly a fire burning; and, as there was no vent for the smoke but by the door, the whole house was both smoky and hot, insomuch that we, who were not used to such an atmosphere, could hardly endure it a moment. * * In some respects their habitations are neat; for, besides the ornaments at top, I saw some with carved door-posts.

The two storeys recall the houses of the Gilbert Islanders, and it is unfortunate that Cook did not tell us more about the means of getting up stairs. Probably the close atmosphere made observations of the interior very difficult. The ornamented peak seems to have disappeared in the more modern houses, as similar shell decorations have gone out of fashion with the gables of the Fijians.

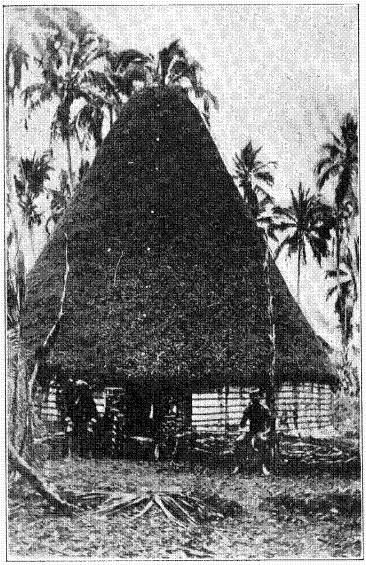

FIG. 60. NEW CALEDONIAN HOUSE.

Solomon Islands.—From Dr. Guppy, who had opportunities to make observations on many islands of the Solomon group, we take the following rather fragmentary account of the houses he found:[36]

The villages in the eastern islands of the group vary much in size. They usually contain between 25 and 40 houses, and between one and two hundred inhabitants. * * In the larger villages the houses are generally built in double rows with a common thoroughfare between; and the tambu house usually occupies a central positions. * * The usual dimensions of the dwelling-house are as follows: length 25 to 30 feet, breadth 15 to 20 feet, height 8 to 10 feet. The gable roof, which is made of a framework of bamboos thatched with the leaves of pandanus trees, or of cocoa-nut or areca palms, is supported on a central row of posts. The sides are low and made of the same materials as the roof. The only entrance is by an oblong aperture in the front of the building, which is removed 2½ to 3 feet above the ground, so that one has literally to dive into the interior, which from the absence of any other openings, is kept very dark. Such are the dimensions and mode of structure of an ordinary dwelling house in the eastern islands. The chiefs, however, have larger buildings, which in some instances * * * rival in size and in style the tambu-houses themselves. Many houses have a staging in front, which is on a level with the lower edge of the aperture that serves as the entrance. On this staging, protected by the projecting roof, the inmates are wont to sit and lie about during the day; and the men occasionally pass the night there. In the houses of the chiefs and principal men, there are generally spaces partitioned off for sleeping and containing a raised stage for the mats; but in the dwelling-house of an ordinary man no such partitions usually occur. Single men sleep on the ground on a mat, which may be nothing more than the leaves of two branches of the cocoa-nut palm rudely plaited together. Each man lays his mat by the side of a little smouldering wood-fire, which he endeavors to keep up during the night, and for this purpose he gets up at all hours to fan it into a flame.

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[36] The Solomon Islands and Their Natives, by H. B. Guppy. London, 1887. p. 57.

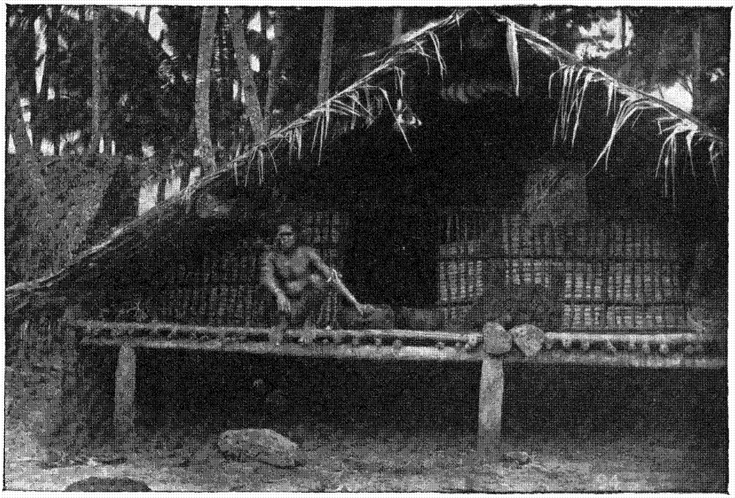

FIG. 61. SOLOMON ISLANDS HOUSE.

Of furniture there is but little except the large cooking-bowls, the mats, and a circle of cooking stones forming a rude hearth in the centre of the floor. I have seen in temporary sheds or "lean-tos", erected by fishing parties on the southern island of the "Three Sisters", fire-places formed of a circle two or three feet across of medium sized *Tridacna* shells, the enclosed space being strewn with small stones.

* * I am not aware how long a native house will last. The white residents, however, tell me that houses built for their own use, which are more substantial than the ordinary native dwellings, will stand some five or six years; and that, notwithstanding the heavy rainfall of this region, the thatch remains admirably waterproof.

* * In the villages of Treasury and the Shortlands, the houses are arranged in a long straggling row; and although close to the beach they are for the most part concealed by the trees from the view of those on board the ships in the anchorage. In the materials used, in their style, and in their general size, these houses resemble those of St. Christoval and the adjacent smaller islands. A thatch made of the leaves of the sago-palm or of the pandanus, covers the gable-roof and the framework of the walls. The usual dimensions of a dwelling-house are: length 25 to 30 feet, breadth 12 to 15 feet, height 10 to 12 feet. * * The residence of Mule, the Treasury chief, was one of the largest native edifices that I saw in the Solomon group. It is a gable-roofed building, measuring about 80 feet in length, 50 feet in breadth, and 25 to 30 feet in height. The front of the house which is at one of the ends of the building, has a singular appearance from the central part or body of the building, being advanced several feet beyond the sides, a style which is imitated in some of the smaller houses of the village. Its interior is very imperfectly lighted by small apertures in the walls. * *

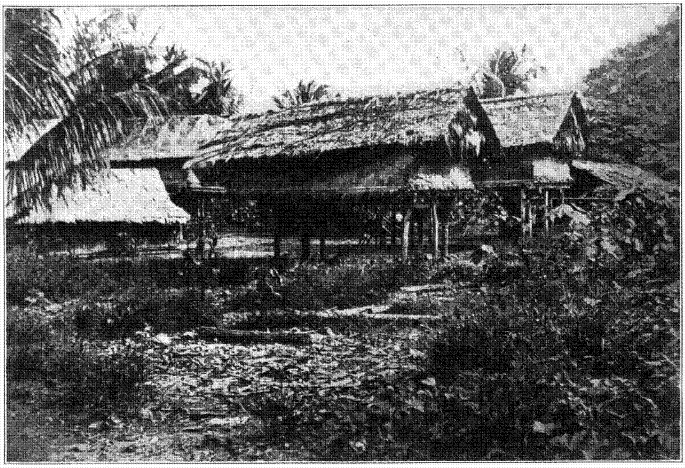

FIG. 62. PILE DWELLINGS IN FAURO ISLAND.

In the two principal villages of Faro, or Fauro, which are named Toma and Sinasoro, a number of the houses are built on piles and raised from 5 to 8 feet above the ground, as shown in the accompanying plate [Fig. 62]. But this custom is by no means universal in the same village, and depends, as far as I could learn, on the personal fancy of the owner. Both these villages are situated on low level tracts bordering the sea; but their sites are free from moist and swampy ground, to the existence of which one might have attributed this practice. The houses built on the ground are about 30 feet long, 20 feet wide, and 12 or 13 feet high; whilst those raised on piles are considerably smaller, measuring 22 by 15 feet in length and breadth, the building itself being supported on a framework of stout poles lashed on the tops of the piles by broad strips of rattan. These pile dwellings are reached by rudely constructed steps made after the style of our own ladders. The roofs of the houses in these villages have a higher pitch than I have observed in houses of the other islands of the Straits. Their eaves project considerably beyond the walls and the roof is often prolonged at the front end of the building forming a kind of portico. A neat thatch of the leaves of the sago-palm covers the sides and roof of each building.

With regard to the internal arrangements of the houses in this part of the Solomon group, but little remains to be said. In many houses a portion of a space is partitioned off for sleeping purposes, usually one of the corners; in others, again, the interior is divided into two halves by a cross partition. More attention is here paid to the comfort of repose than on the eastern islands. In the place of the single mat laid on the ground, they have low couches, raised a foot to eighteen inches above the floor, on which they lay their mats; whilst a round cylinder of wood serves them as a pillow. These couches, which the natives can improvise in the bush in a few minutes, are usually nothing more than a layer of stout poles, such as the slender trunks of the areca palms, resting at their ends on two logs.

In the Tambu-houses of St. Christoval and the adjoining islands we have a style of building on which all the mechanical skill of which the natives are possessed has been brought to bear. These sacred buildings have many and varied uses. Women are forbidden to enter their walls; and in some coast villages, as at Sapuna in the island of Santa Anna, where the tambu house overlooks the beach, women are not even permitted to cross the beach in front. The tambu houses of the coast villages are employed chiefly for keeping the war-canoes, each chief being allowed, as an honorable mark of his position, the privilege of there placing his own war-canoe; but in the inland villages, thes buildings are of course no longer employed for this purpose. Another use to which these buildings may be put is described on page 53, in connection with the tambu house of Sapuna in Santa Anna, in which are deposited, enclosed in the wooden figure of a shark, the skulls of ordinary men, and the entire bodies of the chiefs.

The front of the tambu-house in his native village is, for the Solomon Islander, a common place of resort, more especially toward the close of the afternoon. There he meets his fellows and listens to the news of his own little world; and it is to this spot that any native who may be a stranger to the village first directs his steps, and on arriving states his errand or particular business. In my numerous excursions, when thirsty or tired, I always used to follow the native custom in this matter, being always treated hospitably and never with any rudeness. The interior of these buildings is free to any man to lie down in and sleep. On one occasion, when passing a night in an inland village of St. Christoval, I slept in the tambu-house, the only white man amongst a dozen natives. Bloodshed, I believe, rarely occurs in these buildings; and they are for this reason viewed somewhat in the light of a sanctuary.

And now we come to the connecting link, a gruesome one, that binds the builders of important, not alone sacred, houses throughout the Pacific, from Hawaii to New Zealand, from Fiji to the Solomons—the human sacrifice. And again the bond between the man, at least the savage man, and the pig already referred to. Returning to our author we read:

The completion of a new tambu-house is always an occasion of a festival in a village. The festival is often accompanied by the sacrifice of human life; and the leg and arm bones of the victim may be sometimes seen suspended to the roof overhead. In the tambu-house of the village of Makia, on the east coast of Uji, I observed hanging from the roof the two temporal bones, the right femur and the left humerus of the victim who had been killed and eaten at the opening of the building; and similarly suspended in the tambu-house of the hill-village of Lawa on the north side of St. Christoval, in which I passed the night, I noticed over my head as I lay on my mat the left femur, tibia and fibula, and the left humerus of the unfortunate man who had been killed and eaten on the completion of the building twelve months before. At these feasts there is a great slaughter of pigs that have been confined for some previous time in an enclosure of strong wooden stakes, which may be allowed to remain long after the occasion for its use has passed away. After the feast the lower jaws of all the pigs consumed are hung in rows from the roof of the building. In one tambu-house I remember counting as many as sixty jaws thus strung up.

The style of building and the size and relative dimensions of the tambu-houses are very similar in all the coast villages of the eastern islands, a correspondence which may be explained from the necessity of the structure being long enough to hold the large war-canoes. As a type of these buildings, I will describe somewhat in detail the tambu-house of the large village of Wano, on the north coast of St. Christoval. Its length is about 60 feet and its breadth between 20 and 25 feet. The gable roof is supported by five rows of posts, the height of the central row being some 14 or 15 feet from the ground, whilst on account of its high pitch the two outer lateral rows of posts are only 3 or 4 feet high. The principal weight of the roof is borne by the central and two next rows, each of which supports a long, bulky ridge-pole. The two outer lateral rows of posts are much smaller and support much lighter ridge-poles. In each row there are four posts, two in the middle and one at each gable-end. These posts, more particularly those of the central row, are grotesquely carved, and evidently by no unskilled hand, the lower part representing the body of a shark with its head upwards and mouth agape, supporting in various postures a rude immitation of the human figure, which formed the upper part of the post. In one instance, a man was represented seated on the upper lip or snout of the shark, with his legs dangling in its mouth, and wearing a hat on his head, the crown of which supported the ridge-pole. In another case the man was inverted, and whilst the soles of his feet supported the ridge pole, his head and chest were resting in the mouth of the shark. * * * The roof of the Wano tambu-house is formed of a framework of bamboo poles covered with palm-leaf thatch, the poles being of equal size, whether serving as rafters or cross-battens, the latter affording attachment for the thatch. The same materials are used in the sides of the building. With reference to tambu-houses generally in this part of the group, I would remark that they are open at both ends, with usually a staging at the front end raised about four feet from the ground, which may be aptly termed "the village lounge". The tambu-house of the interesting little island of Santa Catalina or Orika—the Yoriki of the Admiralty chart—is worthy of a few specia remarks. Its dimensions are similar to those of like buildings in this part of the group, the length being between 60 and 70 feet. Placed in front of each of its ends are three circles of large wooden posts driven into the earth, each circle of posts being 4 or 5 feet in height and enclosing a space of ground a few feet across, into which are thrown cocoa-nuts and other articles of food to appease the hunger of the presiding deity or devil-god. The ridge-poles and posts are painted with numerous representations in outline of war-canoes and fishing parties, of natives in full fighting equipment, of sharks, and of the devil-god himself, with a long, lank body and a tail besides. * * * Some of the representations on the ridge-poles were of an obscene character. The central row of posts were defaced by chipping, which I was informed was a token of mourning for the late chief of the island, who had died not many months before.

The deification of the shark again is a link binding all the islands together, and it is not surprising that people whose daily food is taken largely from a tropical sea, and who must often have encountered these predaceous fish should have sought to in some way propitiate them. I will not stop here to discuss the fact that the people of some groups while recognizing the divinity of some sharks (as on Hawaii) still pursued the fish as legitimate game,—indeed it was the only game the Hawaiian chiefs had to tax their courage and skill. On the Solomon Islands the shark god had better treatment, as is shown by the carved representations of him and the use of his image to preserve the remains of the dead chiefs.[37]

I hope that this description of the uses of the tambu-houses will explain why I have referred to them so fully, for they are really the "living room" of the male portion of the population, as well as their guest chamber or parlor. The wet climate of these islands would make the raised platforms, which are the lounging places in the eastern Pacific, and the lightly roofed gathering places in the central region, useless the greater part of the year.

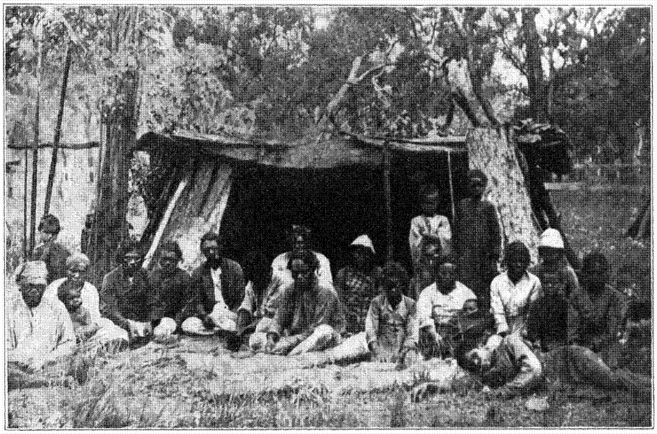

FIG. 63. AN AUSTRALIAN HUT.

Australian Houses.—We seem to have reached the bottom in the Pacific scale of civilization when we come to the work of the Australian Blacks in house building. A couple of forked sticks set up eight or ten feet apart with a ridge pole between the crotches is all the frame, and the stringy-bark tree furnishes the rest in the shape of great sheets of bark skilfully removed and laid against the frame in such direction as to ward off rain or wind. In reaching a new camp it takes but little time to build the wooden tent. A few handfuls of grass or leaves make a lair little, if any, better than a wild animal would scrape together.

Some of the explorers of Australia found something better than this general type of bark hut: Sir Thomas Mitchell in exploring the Gydir region found huts tastefully distributed, over-shaded by the flowering wattle, each dwelling semicircular or circular, the roof conical, and from one side a flat roof or portico supported on two posts extended; these were covered with reeds, grass or boughs. Péron found partly subterranean houses, and others have found framed structures. The more common type, however, was the bark-covered hut which best suited the nomadic life of the people.

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[37] On all the groups that I have knowledge of the sacred nature of the shark does not prevent the use of his dried skin for drum-heads as on Hawaii, or for files or rasps as on the Gilbert Islands and elsewhere.

I hope that one thing has appealed to my readers as it has to me,—the never wearisome simplicity of even the rudest shanty built by the Australian blacks. Never a touch of the commonplace in their villages such as is overwhelming in most of our American towns where the house is sufficiently durable, comfortable for its inmates, and an ample protection from the weather, but utterly devoid of the picturesque. A row, perhaps, of stiff, unlovely cottages each a duplicate of the others, built by contract to make as much show with as little money as possible; the picture is familiar enough in the suburbs of most cities. Hardly more pleasing if more imposing, are the blocks of brick or stone,—even if the stone be a veneer of costly marble,—that line street after street of every large city.

In the Pacific islands most villages seem delightfully diversified: there is little pretentiousness in each house, the grouping among the trees or along the shore is often what no real artist could improve. True, to the practical being of many artificial wants, from a civilized city, the one-roomed shelter would hardly seem a proper stable for horses or odormobile, but to the islanders the almost empty space is pervaded by that most useful of furniture, contentment, and then the house is fully furnished.

The ephemeral nature of the stick and thatch building is typical of the village also, for the frequent wars are generally followed by the destruction of the town of the vanquished, and the remnant of the tribe builds elsewhere rather than clear up the ruins. Or, it may be, a war-vessel of some Christian nation comes among the islands and for some wrong, real or fancied, shells the town. Again some tribes desert the house in which the owner dies, and in which he may be buried. It is not surprising that the *home* sentiment hardly exists under these circumstances. While in Australia the tribes were nomads the limited extent of the Pacific islands confine the wanderings of the people to narrow bounds, and a greater change of abode can only be by emigration, and legendary history tells us this has again and again taken place, as when the Maori went from Hawaiki to Te ika a Maui as their congenors the Moriori had done long before.

Even the old Hawaiian village in spite of the likeness of its houses to hayricks, and its frequently bare exposure, had a fitness to its surroundings, it was never a blot on the landscape. The only complete Hawaiian village I have ever seen was in the valley of Kalalau on the island of Kauai. Remote and difficult af access, it remained uncontaminated by foreign fashions until a few years ago when the attractions of city life drew its few remaining inhabitants to Honolulu, and the frail houses fast perished. It perished, however, a true and unchanged Hawaiian village whose kind will never again be seen in the valleys of these islands. Let us now study these departed houses of the old Hawaiian, gathering from those who saw and described them in the earlier part of the last century what they can tell us and filling out the account as well as may be with the results of personal observation.

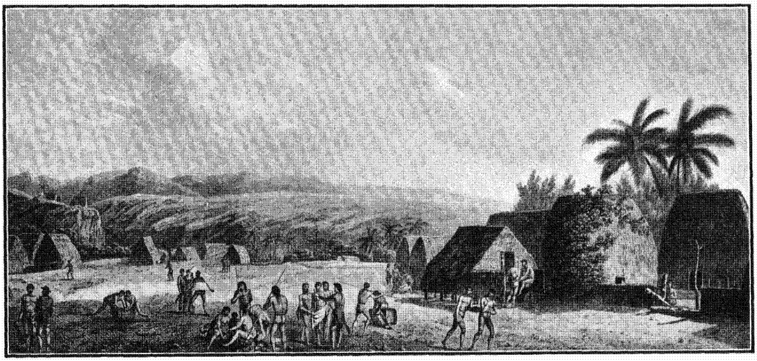

FIG. 64. VIEW MADE ON KAUAI BY COOK'S ARTIST WEBER.

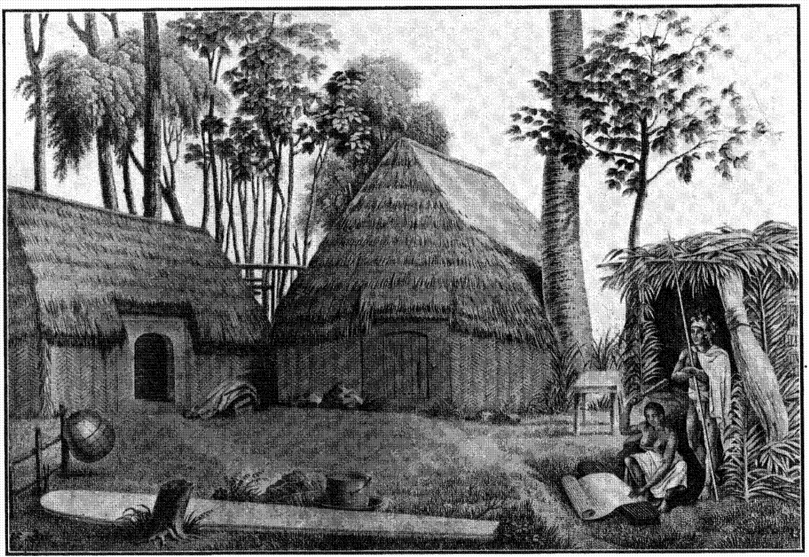

FIG. 65. HOUSES OF KALAIMOKU IN HONOLULU.

The House in Hawaii.

THE Hawaiians were no exception to the general rule that primitive peoples in a mountainous country make their dwelling in caves to some extent. In this group the volcanic mountains offer many facilities to the troglodyte; for the innumerable lava streams that have coursed down their slopes abound in bubbles and conduits often of great extent, and while the superficial streams are so porous as to allow the rains to percolate through their whole mass, the subjacent ones are often more compact and contain dry chambers made accessible on the valley slopes by the erosion of ages, so that there are few, if any, mountain gorges without caves. From abodes of the living they have generally become the last resting place of the dead, and being for that reason carefully sealed up and concealed, are not noticed.

In time of war,—and in the old days that was nearly all the time on some part or other of the group,—caves were the refuge of the old people and children, and the Hawaiian annals, like those of more civilized warring nations, are stained with terrible massacres of such refugees by means of fires at the cave mouth. Some of these caves of refuge extended from the village to the sea like the well-known one at Kailua, Hawaii; others reach a long distance up the mountain slope and have several entrances. Molokai, the often used battle ground of the chiefs of Oahu and Maui, was noted for its cavernous hiding places, and legend tells of many caves where umekes, arms and other native treasures are still hidden, the kahu or keepers all silent in death. In the solitary valley of Moanui are said to sleep the ancient *Moi* of Molokai, each laid in his canoe as our Norse ancestors were laid in the long ship before the barrow was piled above it. Landslides have quite covered the mouth of these royal sepulchres, and only an earthquake more potent than is common on the group is likely to reveal their secrets.

More habitable than common caves were those large lava bubbles where the roof has fallen in admitting the daylight and air, and such still offer a comfortable camping place as the author has many times found in his explorations, and as lately as in the sixties of the last century, they were used in Puna by the mat makers. They were cool and, lighted by the open roof, had the agreeable effect of the Pantheon at Rome with its hypæthral dome.

Not a few of these open caves contain markings on the walls[38] and other indications of former inhabitants, but at present none is in use save for burial, and these may be more fully described in the chapter on Hawaiian methods of disposing of the dead.[39]

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[38] I trust that these curious markings or figures which are found all over the group, even beneath present high water mark, will be fully described and illustrated by Mr. John F. G. Stokes who has given them much study.

The early houses, confining that word to superterrene structures, were doubtless rude tabernacles of branches (*hale kamala*) that reappear in the temporary structures of camping parties of the present day in the Hawaiian wilds. Unluckily palm leaves were not abundant[40] as in the East Indies and the Western Pacific, and most other leaves in drying cease to shelter. Native banana served as temporary shingles and the tough leaves of the ki (*Cordyline terminalis*) when properly applied were somewhat more durable. It is not difficult to imagine these poor dwellings of the early inhabitants, although neither record nor picture remains, but the house into which they developed in the increasing leisure and desire for comfort, we have more knowledge of, and will attempt to describe, although in the advance of foreign invasion even these have nearly passed, and the few that remain are looked upon as curiosities. Forty years ago Honolulu was well dotted with these thatched houses, as has already been mentioned, but when we look to the only native annalist, whose work dates some thirty years farther back, we shall perhaps be surprised at the little he knows about Hawaiian house building, or at least deems worthy of mention. There have been made several translations of the Chronicle of David Malo,[41] but it is best to give here the original with a literal translation of his description of the house:—

MOKUNA XXXIII.—NO NA HALE, ME NA MEA AI ME KA HOOMANA.	CHAPTER XXXIII.—CONCERNING HOUSES, THEIR FURNISHING AND DEDICATION.
1. O ka hale kekahi mea nui e pono ai ko ke kanaka noho ana ma keia ola ana a me ka wahine, me na keiki, me na makamaka, me na mea e ae e hookipa ai.	1. The house was an important and good thing for a man's residence and health with his wife and children, his friends and those who enjoyed his hospitality.
2. He mea maikai ka hale, he mehana, he mea pale aku i ka ua, a me ke anu, a me ka la, a me ka wela. Ua noho nui no nae kehahi poe lapuwale ma na hale pono ole me ka manao he hale pono ia.	2. A good thing was the house for warmth and a shelter from rain and cold, daylight and heat. Many were the foolish people who lived in wretched houses but thought them good enough.
3. O ke ana ka hale o kekahi poe, o ka lua ko kahi poe, o ka loupali ko kahi poe, he puha laau ko kahi poe, he hale kamala ko kahi poe.	3. A cave was the house of some folk, a pit of others, a sheltering cliff, a hollow tree of some, of others a shanty. Some attached themselves

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[39] A plan of such a cave has, however, been given on page 166 of the present volume in illustration of the hiding place of a choice lot of old Hawaiian carvings.

[40] There were only three species of palm, the Coconut, brought probably by the early immigrants and never very abundant, and two species of the Loulu (*Pritchardia gaudichaudii* and *P. martii*), the latter fan palms and not so suited for constructive purposes as the pinnate fronds of the coconut. It has been suggested that the coconuts might have drifted here, but the currents that bring pine logs from the northwest coast of America surely would not bring coconuts.

[41] The latest, by Dr. N. B. Emerson, was printed by the Trustees of this Museum in 1903.

O ka hoopili wale aku malalo o ka poe mea hale kekahi, ua kapaia ko lakou inoa he o keia pili mai, a he unu pehi iole. O ke ano o keia mau inoa, he lapuwale aka. Aole pela ka noho ana o ka poe lapuwale ole, e hana no lakou i hale penei e hana ai.

4. E pii aku no ma ka nahelehele me ke koi a kua i na laau a pau a lawe mai o ka pou na laau pokole, o ke oa na laau loihi, o na pou hana he kiekie laua e like me ke kiekie o ka hale a ke kanaka i manao ai, pela ke kiekie o oia mau laau.

5. O na kukuna ma na aoao o ka hana, he haahaa iho ia, o ke kaupaku, he laau loihi ia e like me ka loihi o ka hale ana i manao ai, pela no ke kaupaku o kuaiole, he laau ia maluna iho o ke kaupaku; o na halakea oia na kia e ku ana maloko o ka hale; o ka aho he laau liilii ia; pau na laau o ka hale.

6. Eia kekahi, a auwahaia na pou a pau, he auwae ma ke alo o ka pou he wahi oioi ma ke kua o ka pou e ku ana iluna pela no na oa e hana ai, he auwae ma ke alo o ke oa, he manamana ke kua o ke oa, i wahi e komo ai ka mea oioi maluna o ka pou i paa, a pau alaila, e kukulu ia ka hale penei e kukulu ai.

7. E kukulu, mua ia na pou kihi, a paa ia mau pou, alaila kauia ke kaula, mai kela pou a keia pou, maluna kahi kaula, malalo kahi kaula, a ike ia ke kaulike o na pou kela pou, keia pou.

8. Alaila, e ana ia ka wa mawaena o kela pou keia pou a i keia ka likepu, alaila, kukuluia na pou a pau oia aoao, a paa ia poe pou, alaila, kukuluia kekahi aoao, a paa ia poe pou, alaila, kauia ka lohelau ma ka waha o ka pou, mai kela pou kihi a keia pou kihi.

9. Alaila, hoaia ka pou me ka lohelau; a pau ia, alaila, kukuluia na pou hana, a paa ia, kauia ke kaupaku a paa ia i ka hoaia i ke kaula, kukuluia, na halakea, kauia na oa a pau a ana ia kahi e moku ai maluna o na oa a pau.

10. Alaila, kuu hou ia na oa a pau ilalo a okioki ia kela oa keia oa, a kalai ia luna o na oa a uuku a hoopoheoheo ia ko luna o na oa a pau. Alaila, kau hou na oa a pau iluna, a paa

to those that had houses, such were called "o kea pili mai" or "unu pehi iole". These were disreputable terms. Not so did those who were not disreputable live, they built themselves houses in the following manner.

4. The man must go up to the mountain forest with his adz and cut down such timber as he needs; then he must carry it down on his back. The posts were short timbers, the rafters long sticks and the pou hanà were long posts that when set up determined the height of the house the man had planned.

5. The kukuna on the sides of the pou hanà are shorter as they approach the corner. The ridge-pole is a long stick as long as the builder plans the house; the upper ridge-pole (kua iole) is as long as the ridge-pole and lashed above it; the halakea are the posts inside the house; the aho are small sticks; this is all the house timber.

6. Then is cut a notch on every post, on the front of the post a projection is cut and back of this a jog in which rests the plate and the rafter which has the end filed into two prongs which ride astride the projection on the post. Both posts and rafters have notches to hold the lashings. When the house is framed it is set up.

7. The corner posts are set up first and made fast. Then a rope is stretched from post to post, a rope at the top, a rope at the bottom, so each post is put in line with all the others.

8. Then space the posts that they be equidistant from each other; then set all the posts of one side and make them firm, and those of the other side in like manner; then the plates are put on the posts in the groove, from one corner-post to another.

9. Then were tied together the post and the plate, and the pou hana set up and made fast to the ends of the ridge-pole. Then the halakea were put in place and the rafters put up and marked at the top where they should be cut off.

10. Then they took down again the rafters and cut on this and that rafter a neck with a head on the upper end of all the rafters. Then they were lashed together and to the ridge-pole,

ia i ke hoaia, kauia ke kuaiole maluna iho o ke kaupaku.

11. Alaila, kau hilo ia ka hale a pau, alaila hoahoia, a paa i ka aho, alaila akoia i pili paha, he lai paha, he lau ko paha, aia no i ka mana o ana pela, pela no e ako ai a paa.

12. Alaila kaupaku a paa, pau ia hana ana, alaila hana i puka, a pau ia, hana i pani, penei ka hana ana, e auwaha ka laau maluna a me ka laau malalo a awaawaa waena, alaila hookomo ke poo o na papa ma keia auwaha keia auwaha o na laau moe aoao.

13. Alaila, houhou i ka iwi kanaka ma kela poo ma keia poo, ma ka auwaha, a ma kia i kui laau, a humuhumu mawaena i ke kaula a paa, alaila, i mau laau i elua, mao o ka puka a maanei o ka puka, e pili ana maloko o ka puka e ku ana iluna a maloko o laila e hooholo ai ke pani, a pau ia hana ana e hanaia ka pa laau a pau ia.

14. Alaila, kiiia ke kahuna pule nana e pule ka oki ana o na mauu maluna o ka puka o ka hale (he kuwa ka inoa oia pule), a pau ka pule ana, alaila komo ka mea nona ka hale a noho ma kona hale me ka oluolu.

15. He hana mau no ka pule ana o ke kahuna ma na hale o ka poe noho pono a pau a me kona alii, a me ka poe hanohano, a me ka poe koikoi, a me ka poe noho kuonoono a pau.

16. Aka o ka poe lapuwale a pau, aole e hana pela, e komo wale no ko lakou hale he hale liilii ko lakou makemake, e waiho koke mai no ke kapuahi ma kahi kokoke i ko lakou poo, e waiho koke mai no na ipu ma ke poo; hookahi no hale o lakou, pela no ko lakou noho ana.

17. Aka, he okoa ka noho ana o ka poe hookuonoono, a me ka poe noho pono, a me ka poe koikoi, a me ka poe hanohano, a me na'lii, e hana no kela mea pono keia mea pono, i mau hale no lakou iho me na wahine a lakou.

18. E hana no i hale e moe pu ai me ka wahine me na keike a e hana no i mau hale a

and the kuaiole was made fast above the main ridge-pole.

11. Then the house was drawn tightly together with ropes and the aho tied on all over the house: then the thatch was put on, grass perhaps, ki leaf perhaps, sugar-cane leaf perhaps, as the owner thought fit, and so the thatching ended.

12. Then was thatched the ridge-pole and the doorway made; this done the door was taken in hand and a rabbet made in the cross stick above and the cross stick below, and a hole made in the centre; then the ends of the boards were fitted in these rabbets resting upon the transverse pieces.

13. Then were drilled, with human bone, holes at both ends through the board and transverse pieces, and wooden pegs driven in; cords through the central holes bound the end strips together; then two sticks were placed one on this side, one on that, and between these and within the doorway the door swung. This work completed, a wooden fence was built about the house.

14. Then was called in the priest to make a prayer at the cutting of the bunch of grass left hanging over the doorway of the house (kuwa was the name of that prayer), and when the prayer was ended the owner of the house entered and settled with comfort.

15. This business of the prayer by the kahuna for the house was in use by the good citizens, the chiefs, respectable men, people of substance and those well-to-do.

16. But the foolish people did not so, but entered their houses without ceremony; they only wanted a small house in which to sleep with the fire-place near their head, and a calabash near at hand; only one house had such people, and so they lived.

17. But in a different way lived the well-to-do folk, and the people who lived comfortably, the men of property, respectable men and the chiefs, each one built enough houses for himself and for his wives.

18. He would build a sleeping house for himself, his wife and children, and large houses

nui no kela hana no keia hana a ke kane, a no kela hana keia hana a ka wahine; he halau kekahi hale, he aleo kekahi hale, he amana kekahi hale.

19. Pela ka noho ana o ka poe kuonoono a pau, oia ka pono a ka poe kahiko o Hawaii nei i manao he ponoia i ko lakou manao ana.

for work by men and others for work by women, also a canoe house, a high house and a house in form of a cross.

19. Such a way of living among the wealthy seemed good to the ancient Hawaiians and they deemed it respectable.

I greatly dislike to interrupt the quaint old annalist, but this is all he has to tell us about the house itself, and we can return to his story and carry it to the end of the chapter when we come to the interior of the finished house; at present we must see what that fine old missionary the Rev. William Ellis wrote about the Hawaiian building as he saw it in his tour around the island of Hawaii at the very beginning of the American missionary efforts on this group.[42]

The houses of the natives whom he had visited today, like most in this part of the island [Hilo district], where the pandanus is abundant, were covered with the leaves of this plant, which, though it requires more labour in thatching, makes the most durable dwellings. The inhabitants of Waiakea are peculiarly favoured in having woods producing timber, such as they use for building, within three or four miles of their settlement, while the natives in most parts of the islands have to fetch it from a much greater distance. In neatness and elegance of appearance their houses are not equal to those of the Society Islanders, even before they were instructed by Europeans, but in point of strength and durability they sometimes exceed them. There is also less variety in the form of the Sandwich Island dwellings, which are chiefly of two kinds, viz., the *hale noho* (dwelling house), or *halau* (a long building) nearly open at one end, and, though thatched with different materials, they are all framed in nearly the same way.

They begin to build a house by planting in the ground a number of posts, six or eight inches in diameter, in a row, about three or four feet apart, which are to support one side of the house. When these are fixed in a straight line, they erect a parallel row, to form the opposite side. In the small houses these posts are not more than three or four feet high, while in the larger ones they are twelve or fourteen feet in height, and proportionally stout. Those used in the chief's houses are round, straight, and smooth, being prepared with great care, but in general they are fixed in the ground without even having the bark stripped off. Grooves are cut in the top of the posts, along which small poles are laid horizontally, instead of wall-plates, and tied to the posts with the fibrous roots of the *ie*, a tough mountain plant. A high post, notched at the top, is next fixed in the middle at each end, and supports the ridge-pole on which the tops of the rafters rest, while, at the lower end, they are fixed on the wall-plate, each rafter being placed exactly above the post which supports the horizontal pole, or wall-plate. When the rafters are fixed, small poles are laid along, where they cross each other above the ridge-pole; sometimes poles are fastened across like tie-beams, about half way up the roof, and the separate parts of the whole frame are *tied together* with strong cinet, made of the roots of the *ie* plant, or fibres of the cocoa-nut husk. The space between the posts at the sides and ends is now closed up with sticks, larger than a common-sized walking-stick, which are tied with cinet in horizontal lines, two or three inches apart, on the outside of the posts, and extending from the ground to the top of the roof. A large house, in this stage of its erection, has a singular appearance. [See Plate XXVII.]

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[42] Narrative of a Tour through Hawaii, or Owhyhee; with observations on the Natural History of the Sandwich Islands, and remarks on the Manners, Customs, Traditions, History, and Language of their Inhabitants. By William Ellis, Missionary from the Society and Sandwich Islands. (Second edition.) London, 1827. P. 313.

If the sides and roof are of plantain leaf-stalks, and the leaves of the pandanus, or of ti leaves, each leaf is woven around the horizontal sticks, which gives it a neat appearance, resembling a kind of coarse matting on the inside, while the ends of the leaves hang down without. But if they are covered with grass, which is most commonly the case, it is bound up in small bundles, and these are tied to the small sticks along the side of the wall of the house, with cinet or cord. They always begin at the bottom and tie on the grass with the roots upward, and inclined toward the inside, and continue one row above another from the ground to the top of the roof. The roof and sides are always of the same material, except where the latter are of plantain or ti leaves. The corners and ridge are sometimes covered with fern leaves [Fig. 66], with which they can secure these parts better than with grass, &c. The shell is now finished, and generally, except in the lowness of the sides and steepness of the roof, looks much like a hay-rick, particularly as until recently they never thought of making windows, and had only one aperture, which was the entrance. A large portion of that end of the *halau* which faces the sea, is usually open. The houses of this kind were probably originally erected for the construction and preservation of canoes, for which purpose they are still sometimes used, though frequently occupied as dwellings. In the common dwelling house, the door is frequently on one side. In the old houses the doors are always low. Since foreigners have resided among them, and built houses with doors and windows, the natives have enlarged their doors, though there are yet but few that can be entered without stooping. Some of them also begin to think windows a convenience, but they by no means fall in with our ideas of uniformity in the disposition of them. Sometimes we have seen a house forty or fifty feet long, with the door at one end, and a small window at the other, half way up to the top of the roof. Again, we have entered a house of

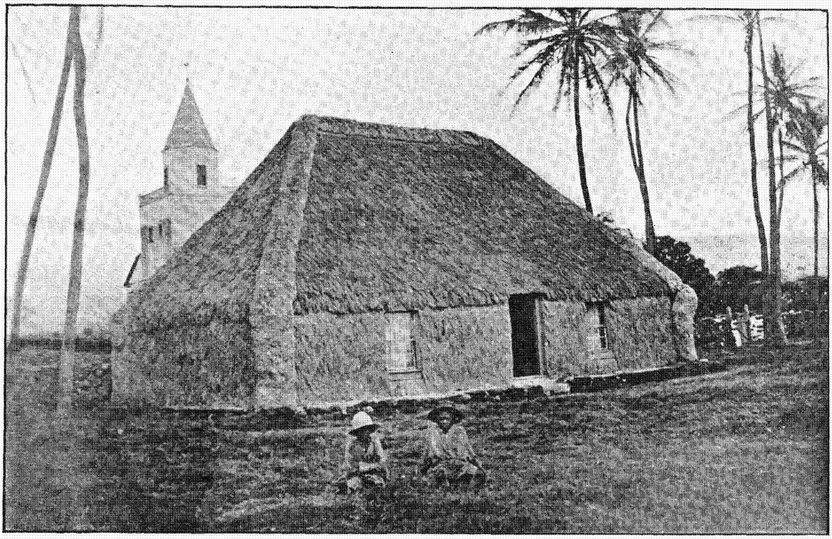

FIG. 66. HOUSE IN WHICH KEELIKOLANI DIED AT KAILUA, HAWAII.

equal dimensions, and in some parts of it we have seen an aperture within a foot or a foot and a half of the floor, generally near their sleeping places. This as well as the other, they call a *buka makani* (wind hole), and assign as a reason for placing it in such a situation, that they sometimes find it close in their houses, and like to have the wind blow on them as they lie on their mats.

The shell of the house being finished, they proceed to fit up the inside, which is soon accomplished, as they have neither partitions nor chambers, and, however large the house may be, but one room and one floor. In preparing the latter, they sometimes level the ground, and spread grass over it, which they cover with large mats made of the leaves of the pandanus. But the best floors are those formed with pebbles, or small fragments of lava, which are always dry, and less likely to be infested with vermin than those covered with grass.

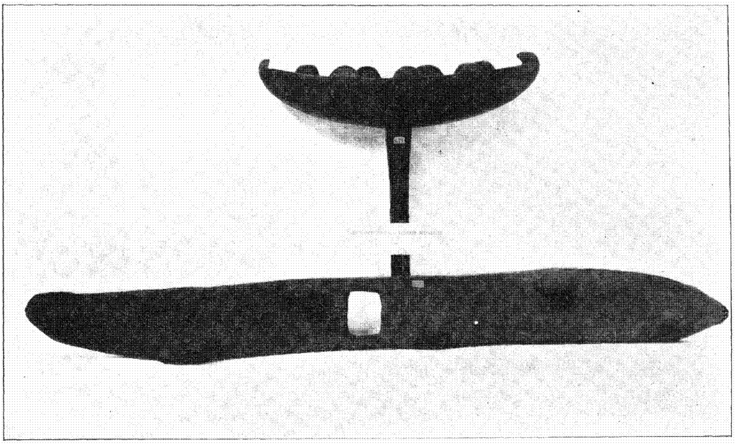

FIG. 67. HAKAKAU FOR SUSPENDING CALABASHES.

The size and quality of a dwelling varies according to the rank and means of its possessor, those of the poor people being mere huts, eight or ten feet square, others twenty feet long, and ten or twelve feet wide, while the houses of the chiefs are from forty to seventy feet long. Their houses are generally separate from each other: even in their most populous villages, however near the houses may be, they are always distinct buildings. Although there are professed house-carpenters who excel in framing, and others who are taught to finish the corners of the house and ridge of the roof, which but few understand, yet, in general, every man erects his own house. If it be of a middling or large size, this, to an individual or a family, is a formidable undertaking, as they have to cut down the trees in the mountains, and bring the wood from six to ten miles on their shoulders, gather the leaves or grass, braid the cinet, &c., before they can begin to build.

But when a chief wants a house he requires the labour of all who hold lands under him: and we have often been surprised at the dispatch with which a house is built. We have known the natives come with their materials in the morning, put up the frame of a middling-sized house in one day, cover it in the next, and on the third return to their lands. Each division of people has a part of the house allotted by the chief, in proportion to its number; and it is no unusual thing to see upwards of a hundred men at a time working on one house.

A good house such as they build for the chiefs, will keep out the wind and rain, and last from seven to ten years. But, in general, they do not last more than five years; and those which they are hired to build for foreigners, not more than half that time. In less than twelve months after my own grass house was built, the rain came through the roof from one end to the other, every time there was a heavy shower.

In some of the islands the natives have recently covered their houses with mud; this, however, does not appear to render them more durable.

While idolatry existed, a number of superstitious ceremonies were performed, before they could occupy their houses. Offerings were made to the gods, and presents to the priest, who entered the house, uttered prayers, went through other ceremonies, and slept in it before the owner took possession, in order to prevent evil spirits from resorting to it, and to secure its inmates from the effects of incantation.

When the house was finished, it was soon furnished. A sleeping mat spread on the ground, and a wooden pillow, a wicker basket or two to keep their tapa or native cloth in, a few calabashes for water and poi, and some wooden dishes, of various size and shape, together with a *haka*, were all they required. This latter article was sometimes like a stand used by us for hanging hats and coats on. It was often made with care, and carved, but more frequently it was a small arm of a tree, with a number of branches attached to it. These were cut off within a foot of the main stem, which was planted in some convenient part of the house[43] and upon these natural pegs they used to hang their calabashes, and other vessels containing food. They generally sat on the ground, and took their food near the door of their house.

The old Hawaiian was a shore-dweller that he might be near his chief animal food,—the fish so abundant about the coral reefs that fringe his island home. Wherever the hard black lava line retired to form a bay, or made a breakwater behind which sand might collect to form a beach there a village could be seen. And even where the lava cliffs made canoe landing difficult, as in parts of Puna, Hawaii, there, that he might be in touch with the ocean, he hoisted his canoe up the cliffs by means of rude davits. Today his descendants have flocked to the foreigners' town and the picturesque little bays and tiny beaches are deserted unless they happen to be a convenient landing to the nearest sugar plantation, and a few piles of stones and perhaps a clump of coconut trees tell the tale of the former fishermen who made a comfortable living by catching fish for his family, or to exchange for other needed things, and to supply his chief.

Near the mouth of the valleys that on every island of the group cut into the mountain mass on every side the old Hawaiian planted his kalo in the ponds so ingeniously supplied with water, and farther landward he had his plantations of sweet potato, waoke and oloná, but his chosen home was still near the sea that had borne his ancestors in their long journey from Kahiki: in this new land it was still the connecting link with the old home which it took him many generations to forget amid the pleasanter circumstances of his new world. We do not find in the ancient songs any glimpse of homesickness, and seldom are these songs tinged with darker shades of flight from enemies[44] or banishment, as often predicated of the immigrants by guessers at their origin.

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[43] These haka or hakakau were often placed outside the house on the kahua or platform as may be seen in Plate XXVIII. Their common form is shown in Fig. 67.

They lived on the shore and their little world was bounded by *mauka* (towards the mountain) and *makai* (towards the sea), and on that ground timber was neither abundant nor suited to housebuilding. They had planted Hau (*Paritium tiliaceum*) and Kou (*Cordia subcordata*) for shade, and the Ulu (Breadfruit, *Artocarpus incisa*) and Niu (Coconut, *Cocos nucifera*) for food, but none of these is suited for building. The native shore vegetation in most of the Polynesian islands is scant and mean. Immigrant weeds have everywhere landed like the Polynesians themselves, but higher up the mountain slopes, as high as vegetation reaches are dense forests of very valuable trees, mainly of hard wood, and to these forests (*nahelehele*) the intending builder must go.

In selecting a log for carving into an idol, of course priestly magic played its part, and dreams and omens directed the seeker; so the canoe builder trusted to his god, the friendly little elepaio (*Chasiempis*), to indicate a proper tree neither worm-eaten nor decayed, but I cannot say with certainty that any such supernatural intervention was required in the selection of the few sticks of limited size used in the framing of an Hawaiian house. The priest (*kahuna*), who, in the infancy of a people, always has a finger in every concern of his fellow men that conduces to the increase of his power or property, had doubtless selected the position of the intended house, that is, determined what our Chinese neighbors would call its *fung shui* or lucky outlook ("wind and water" rules), and had been duly paid with mats, kapa, coconuts, bananas, pigs, fish or such other portable property as he most desired or his client was best able to pay, and he seems to have allowed the man a respite until the work of building was complete when he again intervenes, as we shall see later on.

The selection of timbers was nevertheless no haphazard choice. The old Hawaiians had a remarkable knowledge of trees and plants; they gave them names and exploited their useful qualities in a way that their descendants have wholly forgotten. They were not likely to pick out a tree that was not durable, and they had a building requirement that the posts and connecting rafters, forming with the ground a pentagon, should be, so far as each set went, of the same kind of wood; with this exception[45] they were free to use any durable and otherwise suitable wood. The best houses, however, were generally built of naio (*Myoporum sandwicense* Gray), uhiuhi

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[44] The tale of Paao and others was of self-banishment and sorrow at leaving home, but there is little repining in the land which gave them a refuge.

[45] This arrangement must be followed or they would not be able to live quietly and comfortably in the house. Cases have been pointed out to me where this wise precaution had been neglected by the builder or his contractor, and the owner could not live in the house until the defect had been remedied. In cases where the kahuna had made a mistake in the location nothing but a complete removal of the unfortunate house would set things to rights with the gods or their legates the priests. I have been told of one house that had to be moved twice, the gods were so hard to suit.

(*Caesalpinia kauaiensis* Mann), kauila (*Alphitonia excelsa* Mann), mamane (*Edwardsia chrysophylla*), kamani (*Chrysophyllum inophyllum*) and koa (*Acacia koa*), although the last was used more for canoes than for house timbers. Ohia lehua (*Metrosideros polymorpha*) was used in inferior houses, and lama (*Maba sandwicensis*) in houses built for the gods. See the illustration (Fig. 95) of the hale lama below in the account of the modern grass houses.

So far as I have been able to discover, the ancient Hawaiians had no housebuilding guilds such as were common among the southern Polynesians and embraced a full system of master builders and apprentices. Doubtless at first each man, with the help of his neighbors, built his own simple house. He went up to the forest and collected the timber little by little; brought it down with the help of his wife and children and perhaps his friends. When it was all on the ground he had what in New England, not many decades ago, would be called "a raising bee", when all his friends assembled to lend a hand in raising the frame and thatching the house. Doubtless he regaled his helpers with poi and baked pig or dog as did the New England farmer with cider, pies and doughnuts. If the owner of the house happened not to be *akamai* in housebuilding (skilled in the art), he would doubtless call to his aid a *kuenehale* or man whose knowledge of house carpentry was greater than his own to tell how long and how far apart the sticks should be, and that there was, in later time at least, some definite and well-known rule about all this, is shown in the remarkable similarity of interspaces as well as timber sizes in all of the scores of native houses I have examined all over the group.

A chief had many kuenehale among his retainers, as he was likely to have artisans of the few sorts known among the Hawaiians, and when he desired to build a house, under their direction some men went to the forest for trees from which to shape the house timbers, others to collect the long slim sticks needed in great quantity for the *aho*, others to braid the cord that was to hold the frame together and attach the thatch to the aho, while others collected the pili grass for thatching.

The timbers were not fashioned in the forest, except so far as to cut a neck at one end to which the rope used in dragging the log down could be made fast. Most of the timbers could, however, be carried on the shoulders of the muscular old Hawaiians. When on the ground they were generally hewn into a uniform surface with the stone adzes, although in poorer houses I have seen posts simply stripped of bark, if this had not been torn off in the dragging over a rough trail. In most of the woods enumerated as preferred for house building it was important to cut away all the sapwood to insure the durability of the posts. The illustration given will show the adze marks in the hewn timber (Plate XXVI, and Figs. 77–82), and these were never covered with sennit as in Tonga and Samoa.

The stone adzes were the principal tools used in all the house framing, although fire was used at times in felling trees. When foreign tools came to the Islands they were not at once popular: the adze, they said, was too heavy (for men who swung a ten-pound stone adze-head!); and when the superior durability of the metal was acknowledged, the native carpenters still kept the *au* or handle of the stone tool and used plane irons attached with coconut cord in the ancient way. I have seen old canoe makers use a foreign adze to roughly excavate the canoe log and then return to the old stone *koi* to put the proper finish on their work.

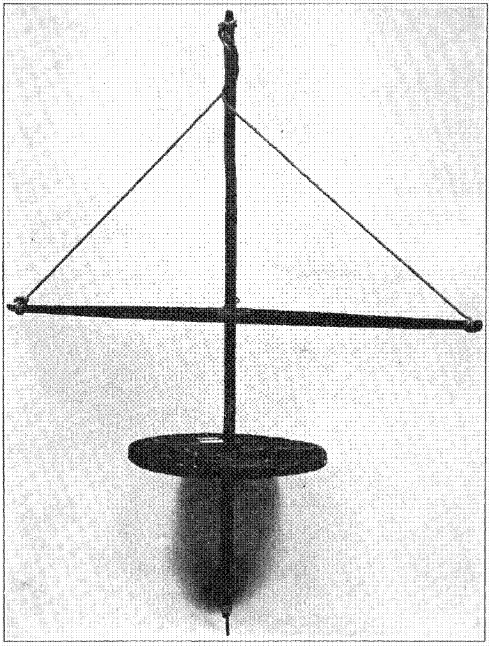

FIG. 68. HAWAIIAN PUMP-DRILL.

In cutting the deep notch in the rafters a stone file was often used, and the ever useful pump-drill (Fig. 68), a tool common throughout the Pacific, served to bore the holes for the pins in the door. To dig the post holes the universal *oo* or digger, a tough stick of convenient length sharpened at one end like a duck's bill, was used. Not a hammer, not a nail. As in the building of Solomon's Temple, "there was neither hammer nor axe nor any tool of iron heard in the house while it was in building." We may add that the general confusion of tongues and shouting among the many workers would have smothered the rat-tat of a dozen hammers.

In place of nails or screws the Hawaiians used cords of various sizes (Plate XXIX) for fastening together the different parts of a house. The largest *aha* of braided coconut fibre served as cable for the stone anchor of a canoe: a size nearly as large fastened the outrigger to the *ama* and these to the gunwale of the canoe. Then came the size used to tie the principal framework of the house together. Smaller cord attached the *aho* to the rafters and posts, and still smaller fastened the tufts of grass to the aho in thatching. The size was also regulated by the strength of fibre: thus a cord of oloná was stronger than one of coconut fibre of equal size, and the latter stronger than one of twice the size made of grass.

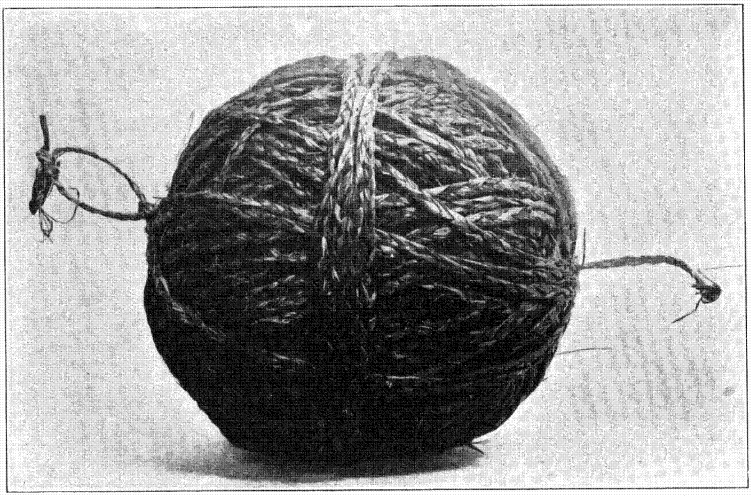

FIG. 69. BALL OF BRAIDED GRASS.

While men were cutting the timber in the forest on the mountain side, others were twisting or braiding cord and winding it into balls often twelve or eighteen inches in diameter, as shown in Fig. 69. On most of the groups this cord or sennit making was pastime of the elderly men whose product was always in demand, and I have elsewhere[46] noted the ingenious method of winding sennit which has been adopted by modern spinners as the best form (Fig. 70). Ellis mentioned ieie fibre as used in the Hilo district, where it was abundant. The house from Kauai re-erected in the Bishop Museum, which is fully figured in Plates XXVI–XXVIII, and Fig. 86, was fastened together by cord (*ahuawa*) made from the braided leaves of *ukiuki*, a liliaceous plant. This was made into large balls and used throughout as more convenient to procure than the coconut fibre which is now never imported as formerly, from the southern islands, and is not prepared to any commercial extent on this group. Neither oloná nor waoke was used commonly in housebuilding, although cord of *hau* served in poorer houses.

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[46] Bishop Museum, Occasional Papers I, Director's Report for 1899, p. 22.

It is surprising to one not familiar with thatching to see how much grass is needed for the purpose. I have thatched a house in the forests of Guatemala with split palm leaves and the material seemed but little bulkier than ordinary shingles, but the pili grass for the Museum building made a pile almost as large as the finished house. This grass (*Paspalum orbiculare* or *Heteropogon contortus*) was common enough all through the coast region and up the larger valleys, and its collection was left to the women and children. In the *corvée* at the building of a chief's house described by Ellis, chiefs often remitted a suitable portion of the district taxes in return for especially fine timber or grass brought by their feudal tenants.

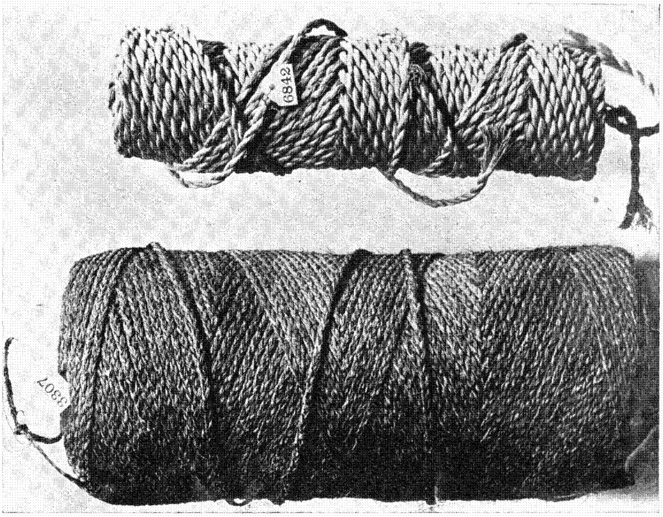

FIG. 70. POLYNESIAN SENNIT IN NATIVE ROLLS.

If, instead of grass, pandanus leaf was the thatching material, it was at hand over almost all the inhabited part of the group, although now nearly eradicated from regions where cane is cultivated: its use for mat-making was more important than for thatching. Of the other material occasionally used, as coconut leaves for screens or lanai roofing, ki plant or sugar-cane leaves, all were in or about the villages. As a rule, I believe, the tenants of a chief had free timber from their chief's land which extended from the sea to the mountain top, but I am not entirely sure, for my sources of information on this point are not quite satisfactory. There was no dearth of wood until the white man with his all-consuming fires came upon the land, but the difficulty of transportation was sufficient to guard against waste.

We will anticipate a little and leave the collected material on the ground—though not so long as it would doubtess be left by the builders—and sketch out the skeleton of the building, much as a modern architect would examine his plans, that the reason for the forms and sizes of the various sticks and their names may be clear to the reader.

The grass house placed in the Bishop Museum and represented in Plates XXVI to XXVIII we have selected to show the different stages of construction,[47] but it is not the oldest and simplest form, which still existed forty years ago in out-of-the-way places, and sometimes among the cluster of houses in a chief's residence.

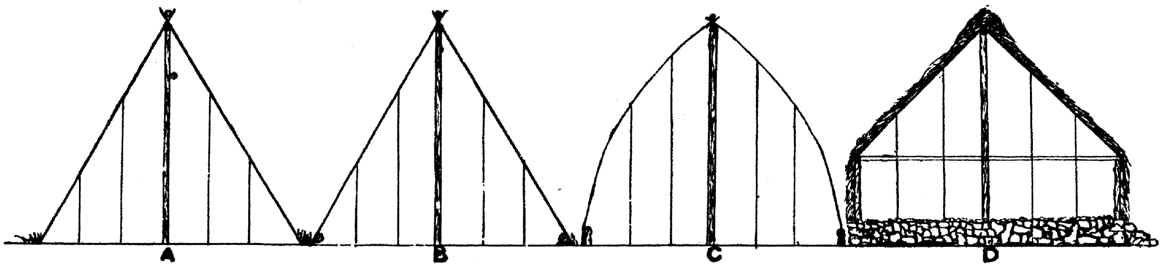

FIG. 71. DIAGRAMS OF HOUSE FORMS.

Two posts, the *pou hanà*, a name which I should translate the *working posts*, were the earliest portion of any grass house, as they would be of any lean-to camp, and the rudest *hale kamala* or shanty. They supported the two ends of the *kaupaku* or ridge-pole. The Marquesan house had these three elements, and in that curious house the rafters reached from the ridge-pole to the wall or the ground, on one side only. In the oldest form of Hawaiian grass house known the rafters extended to the ground from the ridge-pole on either side (see the diagram, A in Fig. 71). At first the rafters were planted in the ground or fastened to stakes. This frame was really a roof, and the house to this point was only roof. However steep the roof, the interior space was smaller in proportion as it rose from the ground: only on the ground level could one enjoy the whole horizontal space the roof covered. This inconvenience led the French architect Mansard to borrow the roof that bears his name, and the Hawaiian builder to bow his rafters as shown in C of the figure. This was a favorite form of house and is shown in Weber's sketch on Kauai, made at Cook's first visit to the group in 1775 (Fig. 64).

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[47] The frame of this house was found in a valley on the northern side of Kauai, by the late W. E. Deverill, and the owners of the land, Messrs. Knudsen, kindly gave it to the Museum. It is made of Bastard Sandal-wood, Naio of the natives, and uhiuhi, two very hard and durable woods, and in the opinion of Mr. Deverill, a good judge, must have been made a hundred and fifty years ago. At any rate the wood shows plainly the marks of stone adzes, and the complete frame is the oldest I know of. The naio is *Myoporum sandwicense*, and the uhiuhi is *Caesalpinia kauaiensis* Mann.

Very soon, probably, it was found best for the stability of the house to fasten the lower end of the rafters to a stick of equal length and parallel to the ridge-pole: this became the *lohelau* or wall-plate. In the Waimea houses of Cook's time these plates were raised on posts, where they were on the banks of the Waimea River, to guard against floods, but the floor remained on the level of the plate which thus became a sill.

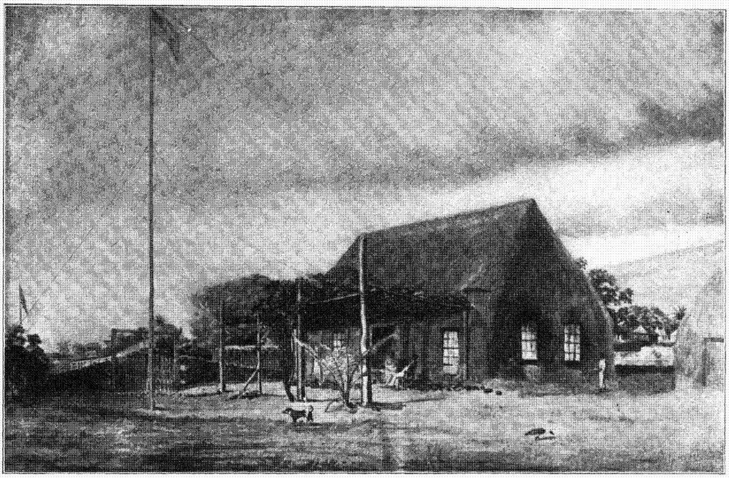

FIG. 72. HALE KAMANI AT LAHAINA.

The space under this form of house was, in the absence of flood waters, an agreeable living room for the family (including the pigs, whose close connection with man in the Pacific has already been noted), and this basement room has always been a favorite with Hawaiians. When the foreign houses were built they were generally raised on posts some feet from the soil, and in such case the house owner, if Hawaiian, by preference occupied the space beneath the floor. When the Princess Keelikolani built her palace in Honolulu, with drawing room and every convenience on the main floor, which was reached by rather high doorsteps, she preferred to live in the cool basement.

Now, if we suppose the houses of roof only, raised, as shown in Weber's picture, four or five feet above the ground, it would be a simple step to lower the floor and cover in the supporting posts with a wall. This change would make the complete house of which all later ones are modifications. One of the most perfect forms of this typical house is shown in Fig. 72, a house built by Kauikeaoule (Kamehameha III) for his sister Nahienaena. The windows are of course foreign additions,[48] but the porch in front was quite in accordance with native style. Other forms of grass houses we shall notice later, but if we have shown that the skeleton in all is essentially the same, growing to its full development by degrees, we are ready to return to our material and watch the old natives, clad solely in the *malo*, put together the frame. It is always a fascinating sight to see a house take shape, and not less so when the active agents are animated bronze statues.

The best houses were built on a *kahua* or platform of stone, usually rounded stone laid dry, but we see in Fig. 65 that the houses of Kalaimoku, the famous prime minister of Liholiho (Kamehameha II), were without this desirable foundation. The two corner posts of the front were first planted whether in the stone kahua or in the ground, and they were fashioned, as Ellis tells us, smoothly for the chiefs and left even with the bark on for the meaner houses, and the top was cut as shown in Fig. 73. Most of the old posts I have examined were not strictly smooth but bore the marks of the stone adze as may be seen in the illustration. The large post shown in Figs. 74-75 was as smooth as if water-worn. A deep groove was cut to receive the *lohelau* or plate: the inside lip of this groove was cut flat and shorter than the outer one, which was fashioned into a point to engage the fork of the rafter which rested on the plate which in turn rested on the flat back of the post. A chin (*auwae*) is cut below the front peak (*ule*[49]) to hold the lashing as shown in Fig. 73. In one case, however, advantage was taken of a projection to cut holes through

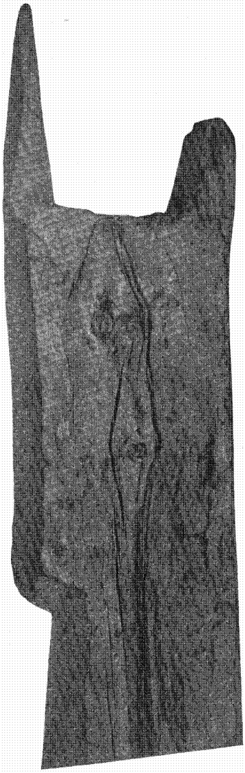

FIG. 73. THE POU OF A HOUSE.

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[48] This house was leased to, and inhabited by, Hon. Gorham D. Gilman of Boston from 1851 to 1861, while he was a merchant in Lahaina, Maui, the ancient capital of the group, and to him I am indebted for the interesting view of this fine house.

[49] It was quite in accordance with the spirit of the Hawaiian language to use such terms: ule=penis, kohe=vagina: but in English we use the terms male and female screw.

which the lashings were passed[50] (Fig. 75). All this shaping has been done while the timbers were on the ground and doubtless the kuenehale has had the holes dug and the posts cut to a proper length before the raising. But no: this pole is too long and the hole has to be deepened not only with the *oo* but with a noise as that which overthrew the walls of Jericho: or the hole may extend to a large rock, and then the pou has to be cut shorter. All these delays and contretemps are taken with perfect good nature: time is of little value, and mahope is better than today! When at last these corner posts are placed to the satisfaction of the kuenehale, a line is fastened between the posts at top and bottom, and the other posts, which are of the same shape as the corner posts but sometimes

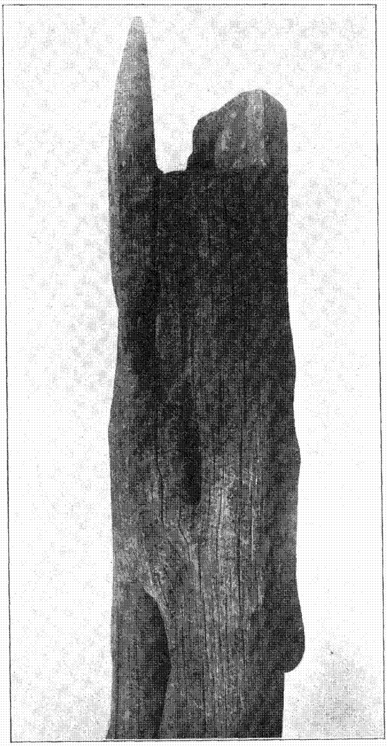

FIG. 74. POU FROM WAIALUA.

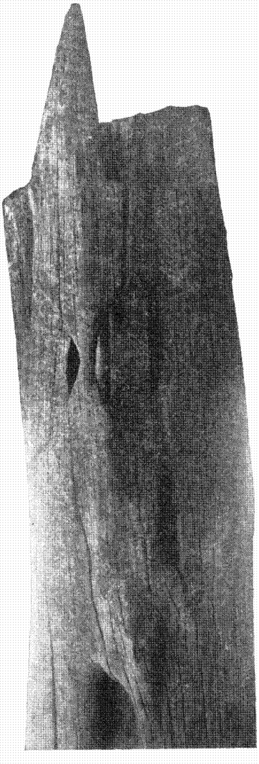

FIG. 75. POU FROM WAIALUA.

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[50] This large pou, which measures 36 inches in circumference and is 9.5 feet long, was found by the Rev. W. D. Westervelt in a swamp at Waialua, Oahu, and by him given to the Museum. The log is hollow, and was probably so when first used.

less in diameter, are placed in line, with equal interspaces, and firmly fixed in the ground; the plate, lohelau, is then placed in its groove and temporarily bound to each with cord.

The opposite side is next erected, and the old Hawaiians must have had some difficulty, in case of a large house, to get the correct position, for they do not seem to have had the method of the Maori of the *hauroki* or measurement by diagonals; at least, I find no word in the Hawaiian language corresponding to this, and while the small houses were generally fairly rectangular, the large *heiau* or temples were often far from it when tested by the accurate methods of a survey.[51]

The gable ends were next taken, and a cord the length from centre to centre of the corner posts was doubled to obtain the point midway between the posts, where the highest posts, those that determined the height and so the pitch of the roof, were planted, being aligned as were the posts of the front and back. These *pouhanà* were notched on the top to receive the ridge-pole, and like the carved centre-post of the New Zealand house, had something of a sacred character, although not to the extent, perhaps, of the Maori post. Under one of these was buried the victim anciently offered to the gods,[52] although some authorities claim one of the corner posts for this honor. As there is a special name for this post, *pou o Manu*, it would suggest that it might be any convenient post. I have never dug up any bones on the site of an old house, with a single exception: in my own garden I found the skull of a young male about where an ancient house stood, but there was nothing to show what post of the house stood where the skull was found; and it might have been a simple interment. It is so long since the custom of sacrifice ceased that probably no bones would remain. By analogy in considering the custom of the other Polynesians, I am inclined to believe that a pouhaná was the chosen post. Half way between the pouhanà and the poukihi came the *kukuna*, posts planted in the ground and lashed to the end rafters. Stout ropes were then bound around the house to hold the whole frame tightly together until the rafters were in place.

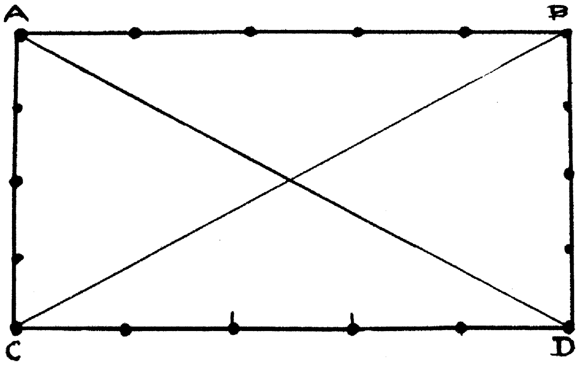

FIG. 76. DIAGRAM OF HOUSE PLAN.

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[51] This common measurement is simply this, referring to Fig. 76: AB = CD and AC = BD, but it is not a rectangle unless AD = CB.

[52] While there can be no question that the offering was made to secure the stability of the house, there is question as to what god the offering was made. The name of the post at the base of which the victim was placed was *pou o Manu* which hardly lightens the difficulty. Manu was the name of the two gods standing at Lono's door. Manu, meaning throughout Polynesia a bird, was in mythology applied especially to "The great Bird of Tane, the Bird that goes round the heavens." In Hawaiian it is The great white Bird of Kane. Among the Maori the *kiwi* or *Apteryx* is called Te manu huna a Tane, "The hidden bird of Tane." On the other hand the Polynesian word manu means to launch, to cause to float, to establish, and the name of the post may merely signify a memorial of the founding of the house, a sort of "corner stone".

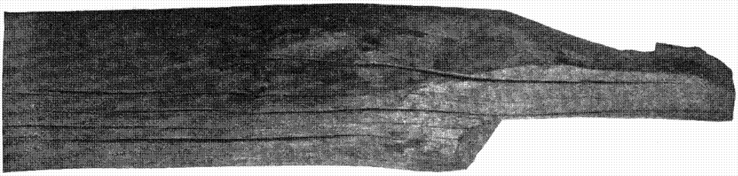

FIG. 77. UPPER END OF RAFTER.

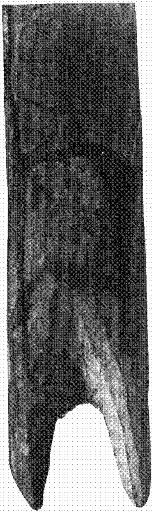

FIG. 78.
UPPER SIDE OF LOWER
END OF RAFTER.

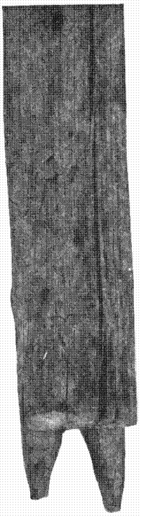

FIG. 79.
UNDER SIDE OF LOWER
END OF RAFTER.

There were then ten posts that had special names in every house: two pouhanà, four poukihi and four kukuna; the last were not cut on the top as the others were. All the other posts were alike and designated simply pou.

The *oa* or rafters equaled in number the front and back posts, and the lower ends were cut all alike into a heel and fork, the latter called *kohe* as it was to fit the *ule* of the post (See Fig. 78). They were put in place resting on the plate and post with the upper end resting on the ridge-pole, and marked where they should be cut off above the ridge-pole. They were then taken down and the upper ends cut in pairs as shown in Fig. 77. I have already spoken of the importance of the requisition that the two posts and two rafters forming a series should be of the same kind of wood. I fancy that in the poorer houses, which must

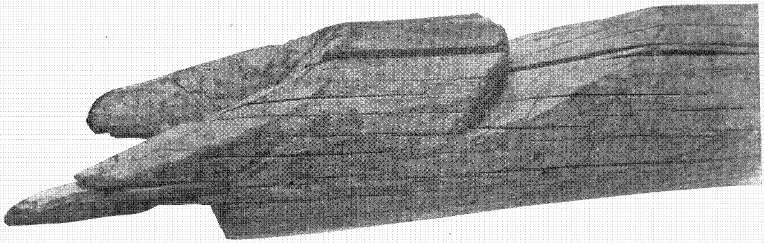

FIG. 80. LOWER END OF RAFTER.

sometimes have been made of the ruins of other houses, this was often neglected, and any odd sticks were doubtless used at times, but I have never noticed in the good houses I have examined any deviation from this rule. The union of the pair of rafters above the ridge-pole was an interesting one, and calculated to greatly strengthen the roof, for above the projecting rafters, which were halved to come into line, and parallel to the *kauhuhu* (Fig. 81, A) was the *kaupaku* (B) or supplementary ridge-pole. Not only were the four sticks lashed firmly together at the point of intersection, but between the rafters the two ridge-poles were also tied tightly together (Fig. 81). Cross bracing was unknown to the old Hawaiian as to other Polynesians, and such braces were not needed and perhaps better away, for a certain degree of elasticity was desirable in a grass house that would be fatal in a boarded house. Only in the Kusaien gable (Fig. 42) is the property of the stiff triangle used to support the ridge-pole, and then it may have been more in the way of ornament than as a mechanical device.

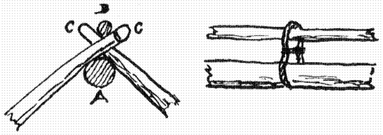

FIG. 81. JUNCTION OF RAFTERS.

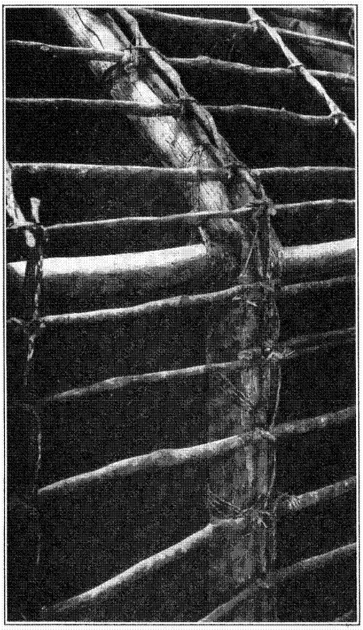

FIG. 82. JUNCTION OF RAFTER AND POST.

While the rafters are being cut the workmen are tying together the pou all around the house, leaving only the space for the door, with *aho*, small horizontal poles about the size of a stout walking-stick, and at intervals of five to seven inches. (See Plate XXVII.) When the rafters are again in place they are first tied together with the flat sides of the neck in contact and then made fast to the ridge-poles and finally to the pou and lohelau. The lower lashing is well shown in Fig. 82. The attachment of aho is then continued all over the roof, and in very large houses cross beams are also added, but this is seldom needed, the aho are so stiff a bracing. Where the depth of the house requires it, vertical aho are placed between the gable-end posts to support and stiffen the horizontal aho. How a house looks in this stage is shown in Plate XXVII. It is in fact a huge inverted basket. The long ropes that bound the frame tightly together are now removed and the spring of the frame tightens all the lashings in a very satisfactory way. As shown in Fig. 82 the aho are not all tied to the rafters, but mainly to another pole of about the same size as the aho, which is lashed at every fourth or fifth row to the rafter as well as to the horizontal aho. This system saves much cord and seems very firm. The thatching is now in order.

I do not know that a separate guild of thatchers existed in Hawaii, but it is certain that the corners and doorway were always entrusted to some skilful persons, the main thatching being done by friends or neighbors of the owner. It was particularly difficult to make the junction of the roof and gable walls weather-tight, for the roof never projected beyond the plane of the wall, which was vertical or nearly so. To close this against rain several devices, more or less effectual, were used, such as braiding the tufts of thatch together, or bonneting the seam with thicker grass, or, more commonly, with fern stems and fronds; the latter device is shown on the house in Fig. 66; but it seems never to have suggested the safer projecting portion of roof, shown in the New Guinea, Solomon Islands, Maori and other houses of the Pacific region. It is not impossible that the hipping of the gable ends as shown in that figure, and in the illustrations of the house in this Museum, was suggested by the acknowledged difficulty of making a tight joint; at any rate the hipped gable seems to have

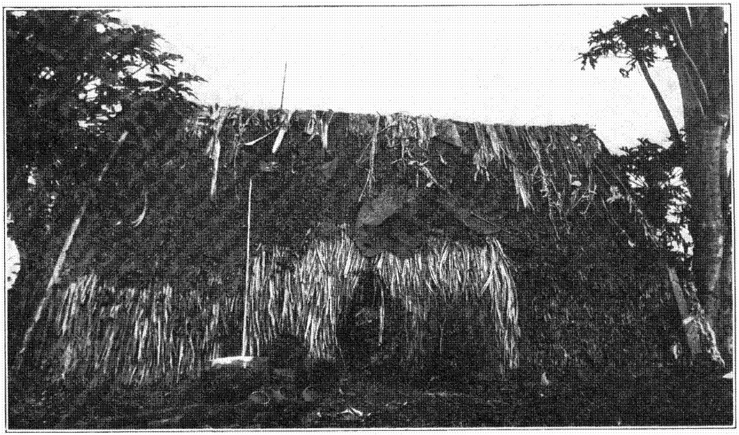

FIG. 83. HOUSE NEAR HILO NEEDING A NEW ROOF.

been a later form of roof, and thence to the end of the age of grass houses on these islands was the more popular one. The rainy Hilo, as it used to be, had houses of this form in very early times, while in the dryer parts of the group a tight roof was not so important a matter. That the whole roof leaked when neglected is shown by the patchwork covering the house given in Fig. 83, from a photograph taken by my friend Charles Furneaux, Esq.

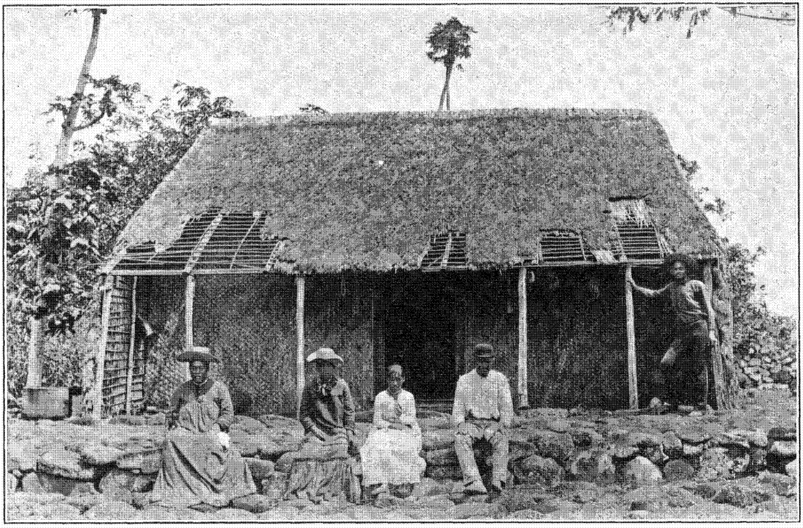

FIG. 84. HOUSE IN PUNA, WITH LANAI.

Turning from this distressful scene of decayed thatch, which was common enough in the last days of the grass age, we may set the thatchers at work to cover our skeleton. The general native word for thatching was *ako* whatever the material used; when it was well and smoothly done the term was *lole:* hence the art of thatching a house was called *lolelau*. There were other words used in different parts of the group, as *paihale*, because it was walling in a house; *papai*, because the tuft of grass being tied to the aho was struck with the left hand to compress it under the cord.

In the neatest houses there was a lining of banana stalks dried, sugar-cane leaves, or, where the leaf was abundant, of hala (Pandanus) leaves; but this was a mere appearance of neatness, for it was a capital *nidus* for the many insects that in this climate infest such houses. The plain grass when *lole*, was more desirable, but even the grass itself was a pleasant harbor by day for countless cockroaches which came out at night to disturb and pillage. These insects are of considerable size, often two inches long, and of remarkable agility and keen appetite. I well remember my first experience with them in a neat grass house in Puna, Hawaii. Father Titus Coan, of the American Mission, and I were traveling along the shore of that now almost deserted region, that grand old missionary on one of his pastoral tours, and I availing myself of his guidance, when we spent a night in a very comfortable native house[53] (Fig. 84). As soon as the kukui nut candles and the native stone lamps were lighted, that one of the younger members of the family, our hosts, might read the bible in the family worship, the unbidden congregation of cockroaches assembled, and it required the active services of a lad to brush the great insects from the page which would otherwise have been covered. When we stretched ourselves on the mat bed, rolled in a sheet of kapa, we had the better of them, for every time we rolled over several gave up their lives in loud pops, and in the morning we found windrows of the crushed remains on either side of each sleeper. They, however, had their revenge, for during the night they ate so much of my bridle that it could not be used until mended, and the oiled silk lining of our hats was reduced to bare threads; one of the party had the entire enamel eaten from his patent leather shoes, leaving rough brown leather. This is one disadvantage of grass houses.

Supposing the lining in place, next the aho, the thatcher begins at a corner with a very thick bunch of grass which he ties firmly to the lowest aho in such a way that it extends somewhat around the corner; the roots are upward, and the cord is bound in a single turn, and the next tuft quickly placed close at its side. The early part of this process can be seen in Plate XXVII, as done on the house in the Bishop Museum. The lower row must lay out on the ground or kahua, if there is one, and the succeeding ones overlap; the durability of the roof or wall and its impermeability depend much on the thickness of these successive layers. We have seen that in the Fijian house the thickness is very great, much exceeding any I ever saw on the Hawaiian group, but then it must be remembered that I saw this work here only in its decadence.

The simple process of attaching the grass continues from the ground to the ridge-pole, and then comes another process entirely: the bonneting may be done in several ways, but the ground and object of each is the same, to so unite the rows of thatch, which on the peak are quaquaversal, that no water can percolate, or be forced in by the wind. Up to this point the skilled thatcher strives rather to make the grass lay flat and present an even appearance on the inside of the house, if there be no lining, and the outside is left to look after itself for the present. The method most commonly used in good houses consists in braiding the half of the grass on each side with a stiffening of fresh grass until the whole forms a compact roll slightly protuberant. (See Plate XXVIII.) Where a trimming of grass or fern is used, as in Fig. 66, the house at Kailua, so much care is not expended, but reliance is placed on this trimming to act as ridge-board. The absence of chimney and of all openings except the door greatly simplifies the work.

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[53] This picture was taken twenty-four years later, when the roof was greatly out of repair, but it serves to show that a well-built house in that dry region will last a long time, when cared for. It seemed likely to last another quarter century, but its doom had sounded, and when, a few years later the family removed to town, the old home soon fell to decay and has long since disappeared, except the kahua or platform.

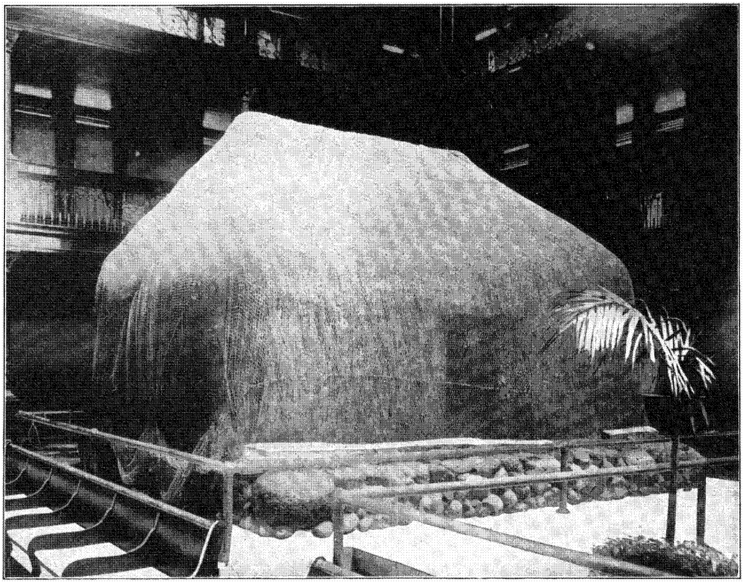

FIG. 85. GRASS HOUSE WITH NET OVER IT.

The grass on each side of the door is carefully braided both for protection to the grass and for the comfort of the persons passing in or out. In the most modern grass houses, those built after the advent of foreigners, boards were substituted for the more difficult finish of braiding.[54] Thatching with grass leaves the aho uncovered within the house, not an unsightly finish if the thatch is well laid; but it must be remembered that there was not enough light by day from the very small door, to show the finish, and by night the feeble light of kukui candles, or even of several oil lamps gave to the aho nothing more than the appearance of dark horizontal lines on a lighter ground. No wonder then that the interior finish was not an object of great solicitude.

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[54] This was the case in Kalaimoku's house (Fig. 65) dating from some time about 1835.

The Hawaiians had a thatching needle (often a rude substitute was used), but seldom used it except on the raised edgings where it was not always easy to pass the stiff cord through the thick mass of grass or fern leaves.

When the thatching was complete, it was customary to put heavy nets over the whole building to compel the grass to dry evenly, and not curl up. This is seen in the picture of the Museum house (Fig. 85). Two or three days of dry weather suffice to fix the grass in an orderly way.

The door was a matter of more carpentry than the rest of the house, and its construction was not easy where there were no sawmills to furnish boards. These must be hewn from logs, generally split logs of no great size, and fitted to two thicker pieces of wood the length of the door width, which were rabbeted to receive the boards. To these transverse pieces the boards were fastened by pegs of wood inserted in holes bored, according to Malo, by drills made of human bone. To give additional strength a larger hole was drilled in the middle of the transverse pieces through which a cord was passed to bind them together.

As to the hanging of the door in olden times there are two opinions: Dr. Emerson, in his translation of Malo, says they were arranged to slide, while as I translate the passage they were swung between two uprights. I have seen in a very old and poor house the remains of a grooved threshold and a broken bar above which might have supported a sliding door, but I have never seen any in use, nor can I find any *kamaaina* who have. Certainly a sliding door would be convenient in a house like that of the Hawaiians, but a hinge of coconut cord was simpler, and hence more likely to have first suggested itself to the primitive builders. I have also seen a pintle hinge used. We have seen that the Maori houses were provided with neat sliding doors, generally decorated with carving, but we cannot consider these primitive houses. The doors of matting—perhaps we should more properly call them curtains or screens —in Samoa were suspended so as to slide with some small latitude, but generally our information about such details as door hanging is pitifully scant.

The Hawaiians had a bar to fasten the door from within, which would indicate a swinging door, but they also had a contrivance to deter uninvited persons from entering at night, consisting of a heavy stone[55] suspended over the door by a rope which passed across the doorway, near the floor, in such a way that an intruder would trip it from a peg in one of the door posts. The weight of the stone (one in this Museum weighs 36.7 pounds) was sufficient to kill or at least disable one on whose back it fell. This man-trap would perhaps be most convenient with a sliding door, but could be so arranged as to be tripped by the act of opening a swinging door. When the family were absent the most secure way of fastening the door was by the *kapu*. The signs of this universally respected prohibition were various: two sticks crossed before a door, as in Fig. 86; stick with a tuft of white kapa or a white ball on the tip, planted on either side, were most usual; while a coconut tree or a bunch of bananas could be preserved from theft by a fillet of white kapa bound around it.

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[55] A figure of one of these door stones is given in my account of Hawaiian Stone Implements, Memoirs, I, p. 351.

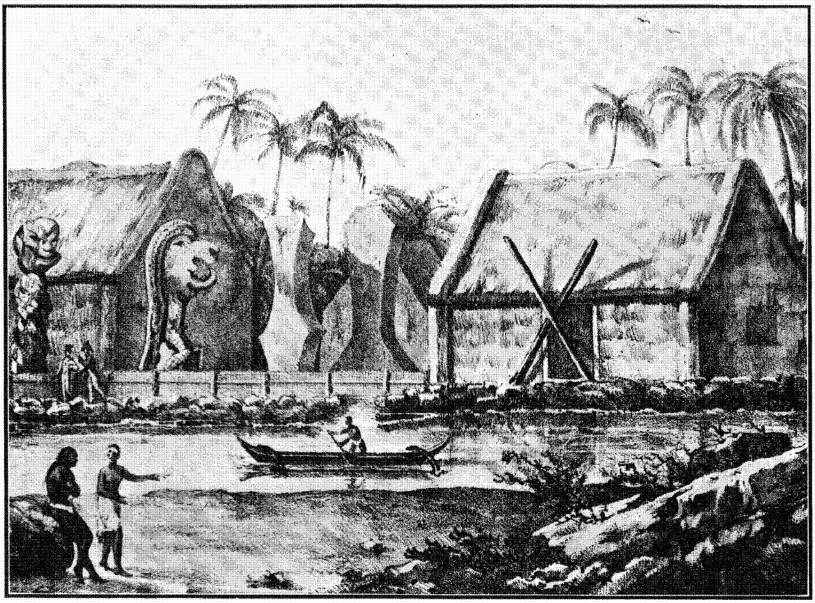

FIG. 86. SACRED HOUSE WITH THE KAPU SIGN ACROSS THE DOOR.

The floor when at its best was of small pebbles carefully leveled and covered with mats. Commoner were the floors of earth covered with dried grass which mats kept in place. Such were the floors of the early churches built for the missionaries, in one of which at Kalapana on the east coast of Hawaii, I have attended and taken part in the worship, while whole families, including pet dogs and pigs, rested on such mats, through the long service, which lasted from nine or ten in the morning until four in the afternoon. The congregation of that early day has passed away, people and missionary, and I am perhaps the sole survivor, for the church is now many feet below the surface of the sea from subsidence of the coast. If I remember rightly one of the Kailua churches on the same island had the same kind of floor as late as 1888.

A fence around the house so close that the intervening space could hardly be called a yard was an important part of a decent house. This was made of palings, or if the country afforded them, as was usually the case, stone laid in a low wall with steps opposite the door. Before describing the religious services necessary to the completion of a respectable dwelling we may read the account Stewart gives of the building at Lahaina, Maui, of the houses Keopuolani, the highest chief on the group, had ordered her men to build for the missionaries who had just arrived at the islands. Although it is much as already described in these pages, I quote it as confirming the previous account, and also because forty-four years afterward I occupied a room in the foreign-built and comfortable house that had taken the place of the rude grass houses, and learned from the venerable man, Dr. D. Baldwin, who then occupied the mission premises, much that has helped my later studies of Hawaiian things. Stewart writes (p. 188):

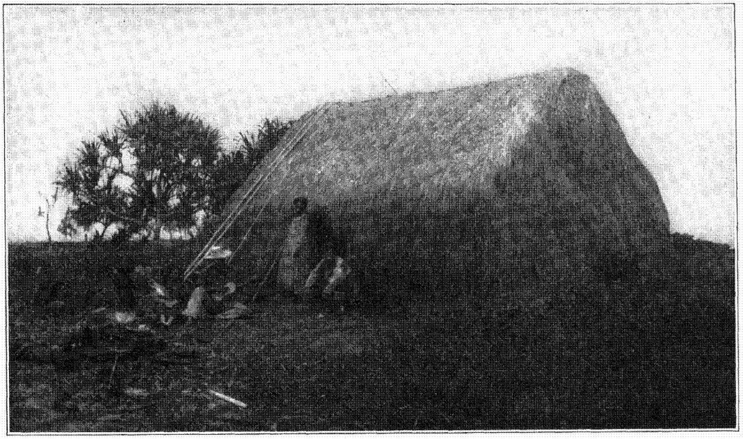

FIG. 87. GRASS HOUSE OF THE POORER SORT.

> The men began digging holes for the corner posts, making each house twenty-three feet long and fifteen feet wide, with a space of fifteen feet between them. The posts are about as thick as the

arm of a man, and after being fastened in the ground are about five feet high. The whole number on each side of each of our houses is seven. The tops are excavated to admit a pole about an inch in diameter, which extends horizontally the whole length of the building, and to which the posts are all lashed with strings made from a small but strong vine [ieie?].

The rafters are as numerous as the posts, and nearly as large, and are fastened to their tops with strings. The principal strength of the joint arises from an extension of the outside of the post, two or three inches above the larger and inner part, which is received into a corresponding notch made in the end of the rafters. The upper ends of the rafters rest on and are lashed to a ridge pole, supported at each end by a long post reaching from the ground to the peak of the roof. Between the corners and these middle posts there are others parallel to them diminishing in length according to the inclination of the roof. These complete the frame of the building. The next business is to prepare a foundation for the thatch. This is done by lashing small round sticks, at intervals of five or six inches, to the posts of the sides and ends, from the ground to the ridge pole; to these the thatch of grass is tied by strings made of the fibres of the cocoa-nut husk. In the best built houses, between the sticks and the grass, there is an inner thatch, or lining, of the leaves of the sugar-cane or banana.

The sequel must be told, and it is one that the small size of the house timbers should prepare us for.

Native dwellings are objectionable in many respects. The wind, dust and rain find ready access to ours in every part; and not only put us to great inconvenience, but often greatly endanger our health. The leaves of the sugar-cane with which they are lined, and the grass and mats forming the floors, are secure and appropriate harbours for the mice, fleas and cockroaches which infest this land, and by which we are greatly annoyed.[56] But were the buildings ever so comfortable for the time being, their frailty would be an objection: the thatch must be frequently repaired, and the whole house entirely rebuilt every three or five years [p. 240].

Of the houses of Lahaina, Maui, Stewart writes (p. 182):

The number of inhabitants is about two thousand five hundred. Their houses are generally not more than eight or ten feet long, six or eight broad, and from four to six feet high; having one small hole for a door which cannot be entered but by creeping, and is the only opening for the admission of light and air. They make little use of these dwellings, except to protect their food and clothing, and to sleep in during wet and cold weather; and most generally eat, sleep, and live in the open air, under the shade of a kou, or breadfruit tree.

Concerning the houses of Honolulu, then the more fashionable town, he has little that is complimentary to say:

The houses of the chiefs are generally large, for the kind of building,—from forty to sixty feet in length, twenty or twenty-five in breadth, and eighteen or twenty in height to the peak of the roof [p. 137]. [See Fig. 93, p. 109.]

Of the *makaainana* or common people as distinct from the chiefs, and composing the bulk of the population he paints a sad-colored but true picture:

The greatest wealth they can boast consists of a mat on which to sleep—a few folds of kapa to cover them—one calabash for water, and another for poi—a rude implement or two for the cultivation of the ground—and the implements used in their simple manufactures. Taro, potatoes, and salt, with occasionally a fish, constitute their general food; while all else that they grow, or take, and every result of their labour, goes to meet the series of taxes levied by the king, aud his governors, and their own respective chiefs.

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[56] Mosquitoes were not introduced until seven years after this was written.

Again (p. 152), on the beach south of the mission premises in Honolulu, he reports:

> The largest hut I passed was not higher than my waist: capable only of containing a family, like pigs in a sty, on a bed of dried grass, filled with fleas and vermin. Not a bush or shrub was to be seen around; or any appearance whatever of cultivation. It was the time of their evening repast, and most of the people were seated on the ground, eating poi surrounded by swarms of flies, and sharing their food with dogs, pigs, and ducks, who helped themselves freely from the dishes of their masters!

All accounts of the homes of the common people about the towns agree that at the time foreigners came to these islands after the voyage of Vancouver, the people were most wretchedly provided. In the country, and along the shores remote from town, the houses were cleaner and better built, if not much larger. I found, a dozen years ago, a few miles north of Kailua, Hawaii, a hut such as Stewart describes. An aged woman was sitting in it (she could not have stood up) and was busy scraping pandanus leaves for mats. She was reputed to be several years beyond the hundred mark.

The thatched house of a respectable man may not become a dwelling place until the *kahuna pule* or priest has blessed the work; a tuft of grass remains over the doorway which he must cut at the time of blessing. This ceremony did not take place until the house was furnished and the owner quite ready to move in; in some places, however, the priest was required to sleep a night in the new house before the owner, that all evil spirits might be thoroughly exorcised. I do not care here to enlarge upon this religious rite, as I hope to do that in another place, but I may be permitted to quote the two prayers given by Dr. Emerson in his notes to Malo, premising that there was no required formula, each priest using such expressions as the particular case might suggest. Thus, if the owner claimed descent from some god or demigod that being was referred to in compliment to the owner: or if the owner was a fisherman Kuula might properly be invoked to help bless the house, etc.

The priest stood at the door with all the friends and neighbors of the owner around in readiness for the feast that was to follow, and holding in one hand the stone adze, and in the other a block of wood, preferably a kapa beater or some other worthy domestic implement, chopped the grass when he came to the proper place in the prayer. This tuft shows over the centre of the door in Fig. 85. The tuft was called the *piko* or umbilicus of the house, and the whole ceremony *ka oki ana o ka piko o ka hale* or cutting the umbilical cord of the house. The Hawaiians observed peculiar ceremonies at their similar operation on the new-born child. Other peoples have also observed in their own way this marking the individual existence of the new life: to mention only one, the Maya of Central America cut the cord on an ear of maize with feasting and other signs of rejoicing. Like all recorded Hawaiian prayers they are interjectional and often difficult to translate—if, indeed, they have any meaning.

Ku lalani ka pule a ke oloalu i ke akua
O Kuwa wahi'a i ke piko o ka hale o ———.
A ku! A wa! A moku ka piko.
A moku! A moku iho la!

A moku ka piko i ele-ua, i ele-ao
I ka wai i Haakula-manu la
E moku!
A moku ka piko o kui hale la
E Mauli-ola!
I ola i ka noho-hale,
I ola i ke kauaka kipa mai,
I ola i ka haku-aina,
I ola i na'lii.
Oia ke ola o kau hale e Mauli-ola;
Ola a kolo-pupu, a haumaka-iole,
A pala lau-hala, a ka i koko.
Amama, ua noa.

In correct form is the prayer of the company to the god.
The Kuwa cuts the piko of the house of ———.
He stands! He cuts! The piko is cut!
It is cut! It is cut down!

Cut is the piko, the shedder of rain, shelter from the water of Haakula-manu, oh!
Cut it!
Cut the piko of your house,
O Mauli-ola!
Life to the house-dweller,
Life to the guest,
Life to the lord of the land,
Life to the chiefs,
Continue the life of your house, O Mauli-ola;
Life to advanced old age, till the eyes are dim,
To the last stages of decay, till borne in a hammock. The prayer is offered. It is free.

Some of the variations in the Hawaiian house may now claim our attention. In all the main structure was the same; stick and thatch, posts, plates, rafters and ridge-pole, but local or individual fancies or needs had their way and an old Hawaiian village was not always a confused cluster of hayricks. In the first place the pouhanà were often, in some places generally, inclined from the perpendicular either at one or both ends of the house, so that the ridge-pole that they supported was appreciably shorter than the distance between their bases. This was a disposition tending to strengthen the house frame, and the higher the house the more important such disposition. This form is shown in Fig. 90, and more definitely in a photograph taken in 1888 (Fig. 89), of an ancient house on the exact site of the priests' houses at the time of Cook's visit and death. This was between the shore and the sacred tank of the heiau where Cook was worshipped; it was deserted and seemed to have been so for some time, although the frame was sound, only the lashings were decayed. Dr. Ellis, the assistant surgeon of Cook's ships, gives us a picture of the houses that stood here a hundred years ago, Fig. 90, and I am inclined to believe that the frame may have belonged to one of these. Since the photograph was taken the house has disappeared.

It was not a great change, but a great advance, to break the pouhanà and the kukuna at the level of the lohelau or plate; carrying this completely around the house, thus strengthening the walls, and shortening the ridge-pole about one-half. The principals still supported the ridge-pole, and the lower portion of the post, set firmly in the ground, was able to resist the thrust which was distributed to the poukihi also by long corner rafters (see Plate XXVII). This form was called *puoa.* Houses built this way were somewhat lower than the older double-pitch roofed houses, and better suited to windy situations. This form was adopted by many of the early settlers, as most convenient when surrounded by a broad verandah.

Another early and exceedingly convenient addition to the common grass house in a land where the people lived so generally in the open air, was the lanai, shown well in Fig. 84: extensions of the rafters continued the roof forward at the same or a slightly reduced slope. This verandah was, generally speaking, the most comfortable part of the house. This lanai was often detached as in the Hale Kamani (Fig. 72), and was sometimes of great size with walls of atap or coconut leaves intertwined, and a nearly flat roof of similar substance which was intended to furnish shade rather than shelter from heavy rain.

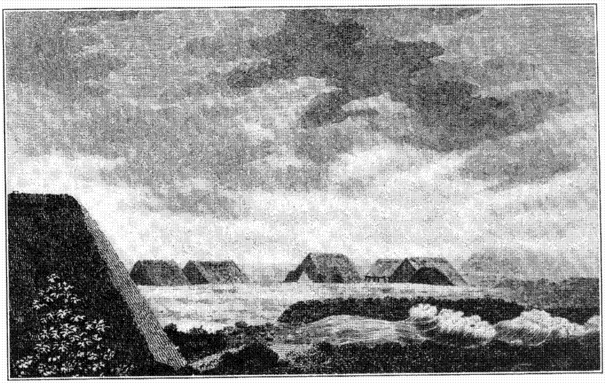

FIG. 88. HAWAIIAN VILLAGE ON NIIHAU: ELLIS.

These coconut leaves (for which in later times date palm leaves were a fair substitute) were often used as an outside sheathing to the walls, protecting the thatch in windy situations, but they never became the important house material that they have been and are in India and the East Indian Archipelago.

In the various accounts of the old Hawaiian houses there is no mention of any pent over the door in the sloping side. The Polynesians understood the importance of shielding the door of the house not only from the direct rain but especially from the

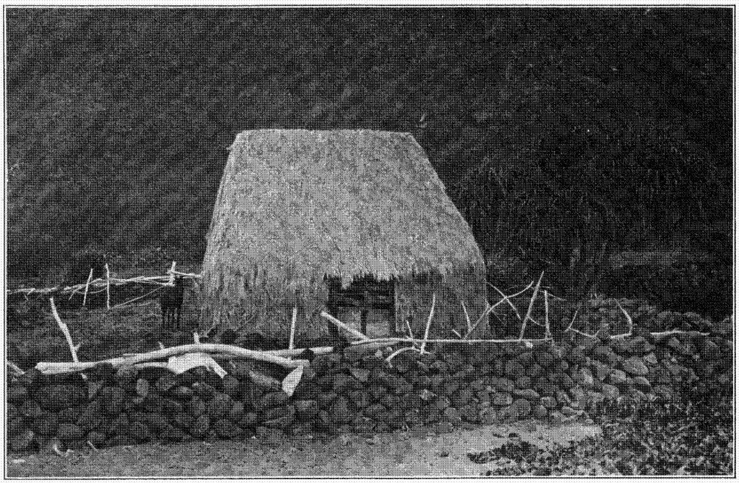

FIG. 89. HOUSE ON THE BEACH AT KEALAKEAKUA.

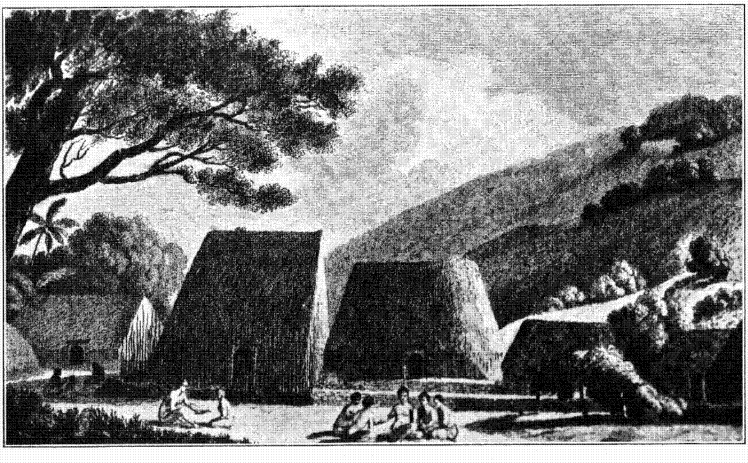

FIG. 90. ELLIS' VIEW OF HOUSES AT KEALAKEAKUA.

accumulated downpour of a steep roof. We have seen that the Fijian, even when his doorway was in the perpendicular wall, formed a pent of thick thatch (Fig. 21). The Maori at the other end of the ocean projected his gabled roof far over the door; but no notice was taken of the contrivance used by the Hawaiians on the sloping side of their house to keep the water from pouring in at every shower. One piece of evidence remains, a picture drawn by Dr. William Ellis (Fig. 91). In that he shows a projection almost a porch. As the steep-roofed grass house had disappeared before I came to these islands, I never saw even the ruins, and no one could tell me how the rain was kept out; in the time of Cook's visit, however, the picture was made which solves the enigma. The arch over the door is to be noticed as it again appears in the later houses of Kalaimoku on Oahu.

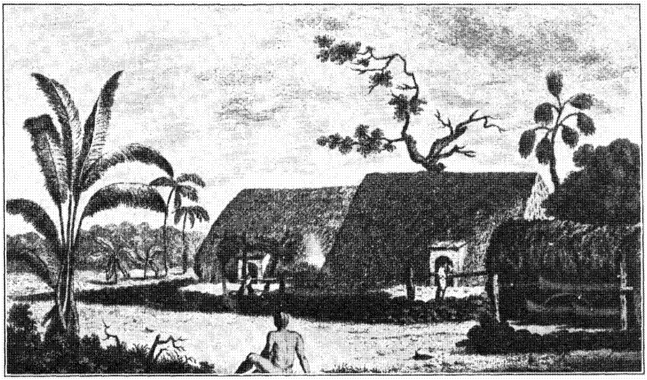

FIG. 91. VILLAGE ON HAWAII: W. ELLIS.

From the abundance of stone on many parts of the group one would expect some houses to be built with stone walls. The old Hawaiians had a tenacious earth, which they mixed with the ashes of some plants to make their salt pans water-tight, which would have answered well to bed the stone, and that they understood the use of this kind of mortar is proved by the walled-up entrances to ancient burial caves, where the earth matching the stone it holds in place, is found in order after the lapse of more, it may be, than a century. While I believe that this construction was among the earliest, I have no proof; and it was not until the early Christian churches were erected that I am sure of its use. The stone walls of the heathen temples, in more than one case, were converted into Christian churches by putting on a thatched roof. There was a similar church in Kona on the opposite side of Hawaii whose stone walls, built precisely as were the walls of the ancient heiau, toppled down in an earthquake in 1867. I am told[57] that there is a small village of stone-walled houses on Maui; they are surrounded with a thick growth of *Lantana* which shelters them.

How early the Hawaiians introduced adobe walls, I do not know; in the early days of missionary work here, the Chiefs' School was built of large adobe blocks and thatched: one of these blocks in good preservation is in the Museum. The well-worked mud of the native kalo patch might have early suggested the use of this material on the dry lee side of the islands. While there are reports of the use of mud to protect the thatch of the roof, this untidy method was apparently little used, still less was mud used to plaster the walls, as did the Micronesians on Kusaie, although there the material was lime mud or plaster. Of all the bizarre materials that the old Hawaiians used for walls, human bones were least appropriate or desirable. In the *Hale Iwi* (house of bones) at Moanalua were built the trophies of a bloody battle, but as new light dawned upon these people, the bones were quietly buried. Fornander gives a brief account of

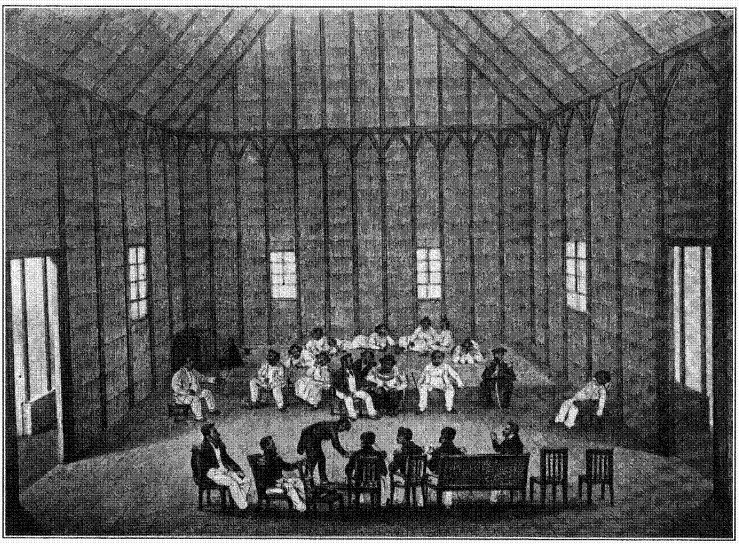

FIG. 92. HALE KAUILA IN HONOLULU.

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[57] My authority is Dr. C. Montague Cooke of the Museum staff.

this house after describing the "Waipio Kimoku," and it is so illustrative of the times just preceding the coming of the white men as settlers rather than as explorers or traders that I quote it in full:[58]

> Fearfully did Kahekili avenge the death of Hueu on the revolted Oahu chiefs. Gathering his forces together, he overran the district of Kona and Ewa, and a war of extermination ensued. Men, women and children were killed without discrimination and without mercy. The streams of Makaho and Niuhelewai in Kona, and that of Hoaiai in Ewa, are said to have been literally choked with the corpses of the slain. The native Oahu aristocracy were almost entirely extirpated. It is related that one of the Maui chiefs, named Kalaikoa, caused the bones of the slain to be scraped and cleaned, and that the quantity collected was so great that he built a house for himself, the walls of which were laid up entirely of the skeletons of the slain. The skulls of Elani, Konamanu, and Kalakioonui adorned the portals of this horrible house. The house was called "Kauwalua" and was situated at Lapukea in Moanalua, as one passes by the old upper road to Ewa. The site is still pointed out, but the bones have received burial.

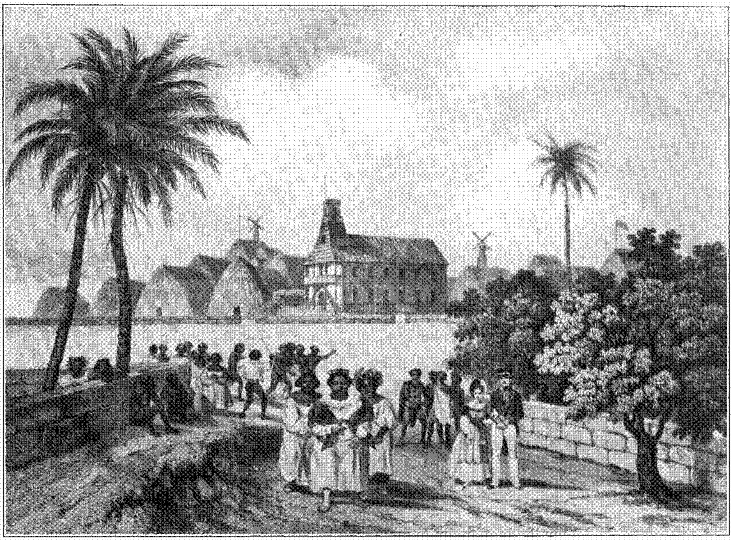

FIG. 93. STREET VIEW IN HONOLULU, WITH KINAU IN THE FOREGROUND: 1837.

We come now to the transition period when the foreign influence and example were felt in the native habitations: and we find that native and foreign patterns were mutual influences, and first we will consider the foreign ways and ideas adopted by the natives. The introduction of higher doors was perhaps the first and most general innovation; next came the windows, whether mere *puka makani*, openings without glass only for ventilation, and these had been known although not generally used long before, or the new *puka aniani* or windows of glass, certainly a wholly foreign introduction Next, perhaps, were wooden floors and partitions within the house. After that the house ceased to be native. We have several illustrations of this changing style: first, the *Hale Kauila* (house built of kauila wood) which once stood on the street in Honolulu which still bears the name of this large council chamber or reception room (Fig. 92). It will be seen from the illustration that while the thatch is attached in the usual way, the pou or posts are much higher than usual and of squared timber; but the most foreign touch, apart from the windows, are the cross braces at the top and between the posts and the plate. It is true that they are too short to greatly stiffen the frame, but they were never used in genuine native work. The scene is characteristic of the time (July, 1837), I will quote the description by Captain du Petit-Thouars of this house (which he calls the house of the Queen Kinau). It must be remembered that the French officer had come to Honolulu to reinstate the Romish priests who had been banished by the native government, and had been joined by Captain Belcher of the Sulphur who was in port at the same time, and the notorious Charlton, British Consul, and Jones the American Consul, none of them friends of the American Mission, and

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[58] The Polynesian Race, II, 226.

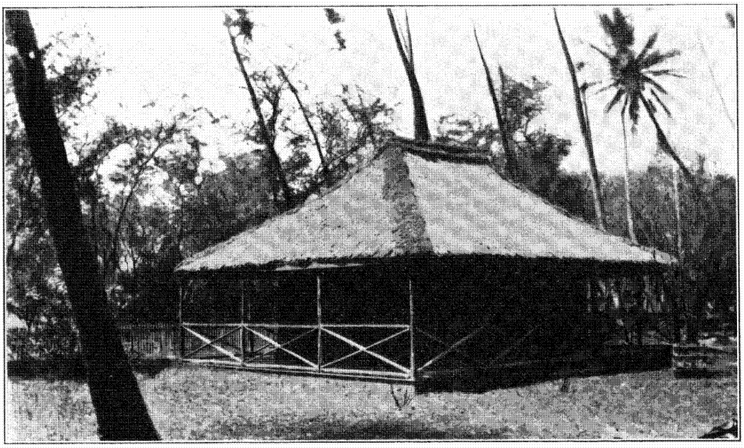

FIG. 94. HOUSE OF KAMEHAMEHA V AT WAIKIKI. HALE LAMA.

the French officer piqued by the firm bearing of Kinau, and the general indifference of the natives could claim only these three unfriends of the Hawaiians and their American teachers, so his views of Honolulu are not always agreeable:

> La case de la reine, dans laquelle nous eûmes nos conférences avec les chefs, est une des plus belles; elle est située à l'E., sous les murs du fort, et auprès du bord de la mer. Cette maison, bâtie en bois et couverte d'herbes sèches, est placée au milieu d'une enciente fermée d'une palissade. La plate-forme sur laquelle elle repose est élevée au dessus du sol de la cour d'environ 30 centimètres et elle est entourée, extérieurment, d'une galerie couverte qui la rend plus agréable.

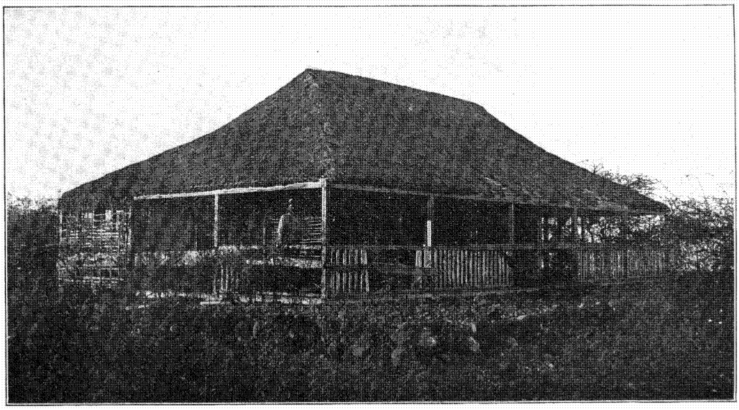

FIG. 95. HOUSE OF KAMEHAMEHA V AT KAUNAKAKAI.

> Sa forme à l'intérieur, est celle d'une rectangle allongé; dans l'un des bouts, il y a un appartement formé par une cloison en planches qui ne s'élève pas jusqu'au toit. Cette pièce sert de chambre à coucher; dans le reste de l'aire de la case, et à l'autre extrémité, il y a une portion du sol élevée de 28 à 30 centimètres, qui est recouverte de plusieurs nattes: c'est sur cette espèce de grand divan que se placent les dames; elles s'y tiennent couchées sur un côté ou sur le ventre: c'est ainsi qu'elles reçoivent et se tiennent pour causer et faire salon.[59]

Present at this conference were the King, Kauikeaouli, his sister Nahienaena, and wife, Kalama, Kuakini (who is asleep in the chair?), Hoapili, Boki and his wife Liliha, Kinau and other chiefs. M. du Petit-Thouars assures us in a note (p. 336) that the figures are fair likenesses.

One of the royal grass houses of the Kamehamehas is still preserved at Waikiki, a suburb of Honolulu. The foreign influence is shown in the surrounding verandah and railing. The walls next the verandah are of grass as is the roof: unfortunately in the illustration, Fig. 94, the shadow of the roof conceals the nature of the walls while showing the reflection of light from the smooth stems of the grass.

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[59] Voyage autour du Monde, sur la Frégate La Venus pendant les années 1836-1839 par Abel du Petit-Thouars. Paris, 1840. I, 384.

The next step is seen in the house built for Kamehameha V at Kaunakakai, on the south shore of Molokai. When the photograph was taken in 1888 the house was in ruin and quite uninhabitable; were it not for the bars across the lanai openings, cattle might have entered this deserted fishing lodge of the king who, like all his family, was so fond of fishing that he often deserted his court in Honolulu and was paddled to this place where he remained for weeks at a time, out of the reach of the foreigners whom he liked none too well. The enclosed corner of the lanai or verandah was very foreign, however, and so were the partitions found within the house.

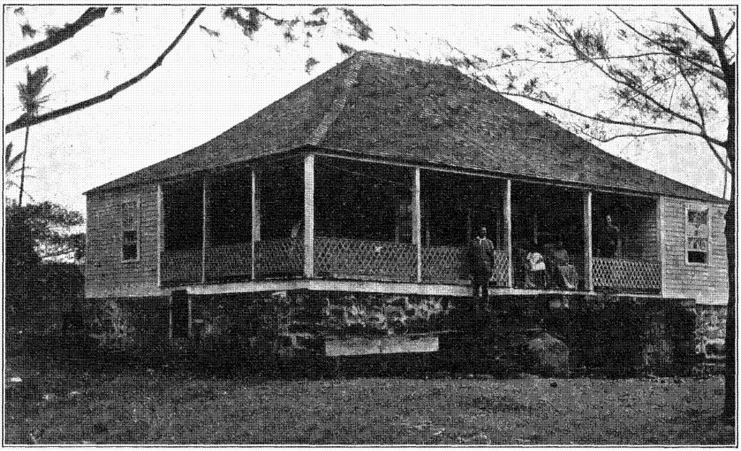

FIG. 96. HOUSE AT KAIMU, HAWAII, IN 1888.

The third picture, Fig. 96, shows a native house converted into a full foreign model: doors, windows, separate rooms, and cellar, a model often used on ranches and in country houses or on the outskirts of Honolulu, most comfortable and suited to the climate.

The only other way in which the Hawaiian dwelling has influenced the foreign house is perhaps in the large lanai found in many houses and used both as a dining room and a general reception room. This lanai is generally open on one or two sides, and in the pleasant climate of these islands is the most agreeable room in the house; it is all the time a stiff model of the old Hawaiian lanai of palm-leaf or grass roof and perhaps a slight wall of similar material on the windward side.

It has been mentioned that the *lama* wood was especially that used for building houses for the gods, that is, the thatched houses within the enclosure of the *heiau* or *luakini* (temple), and its use in building the house for King Lot, Kamehameha V (Fig. 94), gave an excuse for its reported use by an old kahuna (priest) in the king's establishment, for a house of prayer, and I am assured by an old resident that prayers to the gods were frequently offered therein.

Another example of the old Hawaiian building modified by foreign needs is seen in the old Volcano House on the brink of the crater of Kilauea. When this was built for the accomodation of visitors to this which is perhaps the most attractive volcano on earth, access was difficult; the long trail, nearly thirty miles from Hilo, was bad and consumed a long day in the horseback ride. To get foreign material for even a small hotel to this place was very difficult, and recourse was had to the native methods of building to a considerable extent. When the present comfortable hotel was built, after a cart road had been opened from Punaluu, the old house was incorporated with it. In process of modernization the lanai was widened and indeed rebuilt, and the old posts were found to be of hewn naio (bastard sandalwood). It was originally built largely by natives who had their *hale pili* scattered here and there through the region, and made a living by picking *pulu*, an obsolete article of commerce.

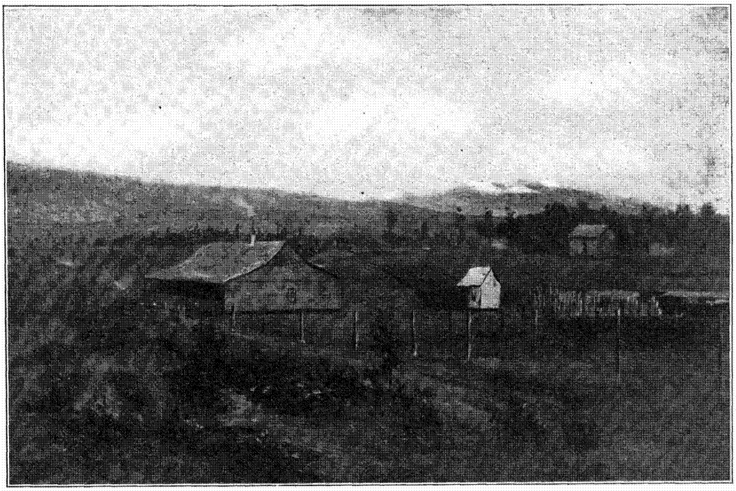

FIG. 97. OLD VOLCANO HOUSE: PAINTED BY HOWARD HITCHCOCK.

Hawaiian Fireplace.—I have left to the last the fireplace which was found in most of the ancient houses. In the colder regions where hunting birds or making adzes compelled some of the natives to dwell for a season, fire was a necessity in the sleeping place, and in the mountain region I have experienced the comfort of the fireplace filled with glowing embers, and although the house had no chimney nor other opening than the ordinary door, there was, to my surprise no trouble from smoke, as the door was left open during the night. In the centre, usually, of the house, and so opposite the door was a shallow excavation walled in with flat stones set edgewise, or sometimes where such stones were not at hand, with larger and wider stones firmly planted as a rectangular wall perhaps eighteen by twenty-four inches. This fireplace was not intended for cooking, which was done out of doors and in an *imu* or buried oven (which belongs properly to the chapter on Food and Cookery).

The fire was kindled carefully and during the night was often replenished by any one who happened to be awake, and in a large company there was sure to be some one awake at any time of night. If a proper selection of wood was made there was little smoke. Often one sees in the stone kahua or platform that marks the site of a vanished house the neatly built fireplace, the last fire quenched so long ago that it differs little in color from the other stone of the ruin.

I do not think the Hawaiian, like his Maori brother, ever cut the fireplace from a single block of stone (see Fig. 32); perhaps there was no stone so well suited for the purpose as is found in New Zealand; nor did he shut himself in with his fire until the heat was almost overpowering; but then his climate never was so chilly as that of southern New Zealand. When the old writers commiserate the ancient Hawaiians for having houses with no outlet for the smoke and vapors of their fire except the low door, it is probable that they never spent a night in such a house with a fire. In modern times, since the introduction of tobacco, the grass house certainly becomes stifling to a nonsmoker even near the open door, for the wild tobacco emits a stench that no island wood could equal. We must now look at the kindling of the fire, although that perhaps should come after the house is fully furnished and occupied, and so be relegated to the third part of this chapter. I will, however, confess to having caught somewhat of the disorderly method of the Hawaiian raconteur, and must plead that if every description is not in logical sequence.

Firemaking.—The Hawaiian, like other Polynesians, made fire by ploughing, not by drilling, although they had the pump drill in very early times. If the first immigrants to the Pacific islands came from Asia they passed through a region where fire drilling was generally practised from Australia to Japan, and as in the case of the loom they "passed by on the other side." If they came from the American continent that also was a land where before the coming of the white man the fire drill was universally used.

With the curious disdain the Hawaiian seems to feel for the works, processes or results of his forebears in heathen times, one cannot be surprised at the utter forgetfulness that has fallen on the modern representatives of this great Polynesian family so annoying when the archæologist tries to resuscitate old customs. Almost as soon as a matchbox could be obtained the ancient implements of firemaking which had well served countless generations were consigned to the limbo of useless things, and their very names soon erased from memory. Names that were obtained more than half a century ago and embalmed in print are the only relics of many a useful and to us interesting process in the daily life of the primitive settlers in the Pacific. I have seen old Hawaiians who worked for Kamehameha the Great make fire at my request, but as the present generation is ignorant of these matters and not eager to be photographed doing such "old fashioned things" I turn to their kin in New Zealand for an illustration (Fig. 98) of the old Hawaiian method of making fire: it was done on

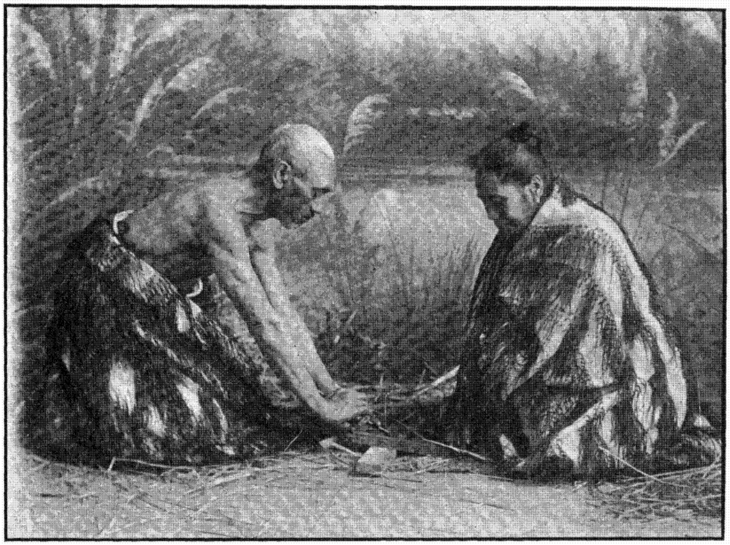

FIG. 98. MAORI FIRE MAKING.

Hawaii precisely as the Maori and his wife are represented doing at the present day in the native villages of New Zealand.[59]

The tools used by the old Hawaiians were a stick of dry, soft wood (*hau* was commonly used), of such size as to be conveniently held between the feet or by another person; and a much smaller stick of hard wood held in the hand and moved rapidly and with force to and fro in a groove on the soft stick called *aunaki* (in Maori *kauahi*), and the harder wood plow *aulima* (in Maori *kaurimarima*).[60] With a few rubs the friction is sufficient to char the wood and in about a minute the dust that collects in the bottom of the groove ignites and the flame is dexterously caught on a bit of tinder or a *welu ahi* (No. 4247, Fig. 99), composed of twisted or braided kapa: this also serves for slow match. The *ohe puhi ahi* (No. 166, Fig. 99), a joint of slender bambu, served to blow the fire when kindling.[61] With volcanic fire perpetually burning on the largest island of the group, and traditionally the one

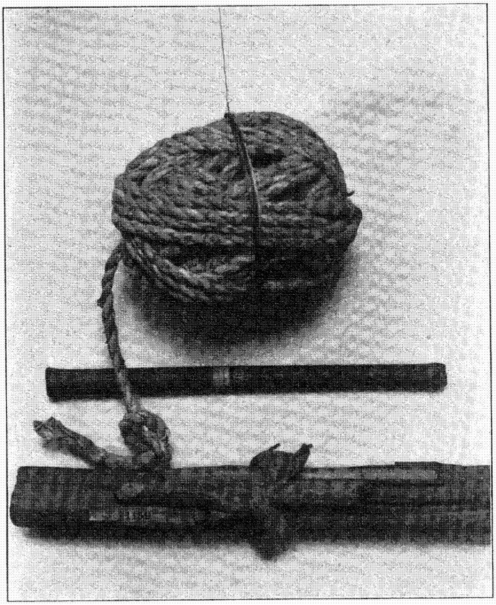

FIG. 99. HAWAIIAN FIRE MAKING TOOLS: IN BISHOP MUSEUM.

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[59] This pair of Urimera Maori was a most interesting antique and fully imbued with the ancient ways and spirit of the old New Zealander. When they visited the white man's town for the first time they showed almost the stoicism of the Amerind at the sight of great novelties, and their comments were often quaint and amusing. The woman thought the white folks must be fools to build one house on top of another when land was abundant!

[60] There is more than a passing interest in the comparison of the words used to designate these fire-sticks in Hawaiian and other Polynesian dialects. *Aulima*, *au* a handle (also the motion of the hand in mixing poi), *lima* the hand (also the numeral five from the number of fingers); in Maori *kaurimarima* (l and r often interchangeable in Polynesian words); Tahitian *aurima;* Mangarevan *kourima*. The lower piece is named in Maori *kauahi* or *kaunoti*, in Tahitian *anai*, Mangarevan *kaunati*. As to the Maori *kaurimarima*, Mr. Edward Tregear remarks in his Maori-Polynesian Comparative Dictionary *sub voce*, "This is probably the only Maori word in which *rima* is used for 'hand', although *rima* [or *lima*] is 'hand' or 'five' almost everywhere else in Polynesia." The motion of rubbing is *hia* in Hawaiian.

[61] It is not necessary to go farther into the process of firemaking by two sticks, as this has been already well done by Dr. Walter Hough in the report of the U. S. National Museum for 1888; but in that paper Mr. R. Brough Smythe is quoted as attributing the use of the fire-plow to all Australians; the drill was more widely used on the Australian continent.

where the immigrants first landed, and with eruptions every few years that nightly brightened Hawaii and the nearer islands for weeks and even months, it is strange that the legends of the origin of fire trace it, not to the redoubtable Pele, goddess of the volcano, but to the humble water-hen (*alae* of the natives) who alone knew how to make fire and long refused to impart the secret to human beings. At last one day the inevitable happened and a man came upon one of these birds who had been warming itself by its manufactured fire. As usual, the bird refused to tell whence came the comfortable blaze, so the human featherless biped seized the plumed one and pressing a still glowing brand from the fire against the forehead of the bird held it there until in its agony the poor wretch gave up its secret in fragmentary shrieks, and as an irrefragable proof of the truth of the legend the forehead of the bird is still red.

The flint and steel of our ancestors were not more efficient than the simple fire-sticks. No flint was found on the Hawaiian group, nor metallic iron, but the compact clinkstone and the hard iron oxide or hæmatite are claimed to have been used by the natives; never so popular as the aulima and aunaki. The application of fire to light rather than to heat will be discussed later with the torches, candles and lamps; but the clear burning embers in the fireplace gave a dim but sufficient light that did not hinder sleep, but showed the indistinct figures moving from their lair to the door or returning without disturbance to their rest; and when the fire-tender put new fuel on the embers the temporary flash disclosed a scene to be remembered.

That I might be sure of the names given to the house parts in olden times I printed a list, which I give below, of words and their definitions as given by Andrews[62] in his dictionary, to be submitted in whole or in part to various old Hawaiians met in the circuit of Hawaii; but the results were not encouraging and but little new was added to the list. Such as it is I offer it here as a convenience to any reader who needs such a vocabulary.

VOCABULARY OF TERMS USED IN HOUSEBUILDING.

Aaa. A humble dwelling; also an uninhabited house (an egg shell).

Aaho. Same as aho.

Aha. To stretch the cord by which the first posts of a house were located.

Aho. Small, straight sticks used in thatching. Aaho seems a corruption.

Aina (hale). A house for eating; he hale aina oia kekahi.

Ako. To thatch; ua akoia ka hale.

Aualo (halau). A shed for storing canoes or other bulky articles; front of house.

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[62] A Dictionary of the Hawaiian Language, by Lorrin Andrews. Honolulu, 1865.

Auau. Name of a certain *aho* to be thatched first in building a heiau.

Auolo = aualo. A shanty.

Auha. A shed to screen canoes from the sun.

Auwae. (Chin.) The projection near the top of a post to hold the lashings.

Auwaha. The fork at the lower end of a rafter.

Hakala. The gable end of a house; the side of a house.

Halau. Long canoe house; eating house for men.

Hale. A house. The six houses considered proper for an ancient householder were:

1. *Heiau*, a chapel where personal idols were kept, and private worship held; this did not require the services of a priest.
2. *Mua*, the eating house for the men, *kapu* to women.
3. *Noa*, where the wife lived, not *kapu* to the husband.
4. *Hale aina*, the eating house of the wife.
5. *Kua*, also *kuku*, where kapa was beaten in bad weather; usually outside.
6. *Pea*, where the wife lived during the period of uncleanness.

Hale alii. A palace.

Hale hau. A house for the gods, made of hau (*Paritium tiliaceum*).

Hale halawai. A meeting house, or council chamber.

Hale kamala. A temporary structure.

Hale koko. House where the *hoalii* slept.

Hale kupapau. A sepulchre, house of the dead.

Hale lalalaau. A structure of the branches of trees, a camp.

Hale malu. A cool or shady porch.

Hale moe. A bed chamber or house for sleeping.

Hale papaa. A storehouse.

Hale poki. A house where the bones of a king were supposed to be deposited. Many other names of houses were used to express foreign ideas, especially in the translation of the scriptures.

Halii. To spread a net over a newly thatched house to keep the grass smooth while drying (Fig. 85); to put down mats after house cleaning.

Hana. Middle post of the end of a house; *pou hana*.

Hio. The corners of a grass house.

Hoaho. To twist strings for a house; to tie aho to a house frame; also hooaho.

Hoaka. A lintel.

Hoopoheoheo. To make a neck on the top of a rafter (Fig. 77).

Hui. The smaller sticks between posts and rafters, and parallel with them.

Kahua. A foundation or platform on which a house is built.

Kala. The ends of a house as distinguished from the front and back.

Kaola. A beam across rafters; a bar for a door.

Kauhale. A collection of houses; a village.

Kauhilo. To bind together the sticks of a house with a rope during construction.

Kauhuhu. The ridgepole.

Kaula. The plate or beam uniting the tops of posts; a rope.

Kaupaku. The upper ridgepole.

Kihi. Outside corner of a house.

Kipaepae. Stone steps; often of hammered stone; usually of the stone built into the *kahua* or platform.

Kamo hale. To dedicate a house.

Kuahui. A scaffold used during building.

Kuene. To measure out the foundation and posts of a house; to set up and tie together the frame; to take down a house and put it up elsewhere.

Kuenehale. A man skilled in house building.

Kukuna. End posts of a house; side posts of a door.

Kulana. Sides of a house.

Kuono. Inside corners of a house.

Laauku. An upright post.

Lala. The four corners of a house; thatch over the door after it has been cut.

Lanai. An open shed; a piazza.

Lapauila. Side posts for a door.

Lio. The tie beam of a house; a carpenter's horse.

Loha. Trimmings on ridges and corners of a thatched house.

Lohelau. Plate to which rafters are fastened.

Lole. To thatch a house smoothly.

Lolelau. The art of thatching a house.

Oa. Rafter of a house (Figs. 77–80).

Olokea. Scaffold used in building a house.

Pahale. The space around a house enclosed by a fence.

Paia. Sides or walls of a house.

Paihale. To thatch houses.

Paku. A partition; the wall of a small enclosure.

Palaau. A fence of sticks.

Palepo. An adobe wall; literally mud hardened.

Pani. To close; hence, a door or shutter.

Panipuka. A door.

Papaa. A storing; hale papaa, a storehouse.

Papahehe. A floor; not necessarily more than a smooth surface.

Papai. A screen; a slight house or shed.

Papai. To thatch, because in the process the Hawaiian, in drawing the cord tight around a bundle of grass, strikes it with the left hand.

Pili. Grass preferred for thatching; *Heteropogon contortus.*

Pou. Side posts of a house (Figs. 73–75).

Pou o manu. Post under which was the human sacrifice.

Pueo. Cords tied around posts of a house during building.

Puka. A doorway; also puka hale.

Puka makani. A ventilator or wind sail.

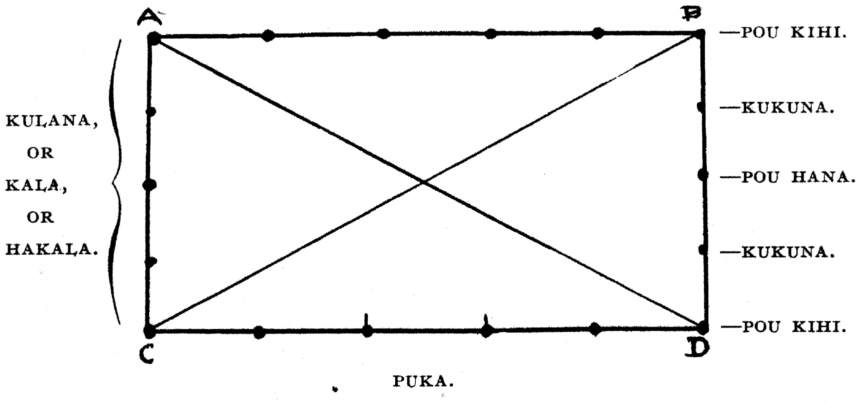
Puoa. A house built with the side poles united at top; a steeple.

Pupupu. A small or temporary house.

Wa. The space between two posts or rafters.

Waha. Fork in lower end of a rafter (Fig. 78). Same as auwaha.

Wekiu. The top of a house.



House Belongings: The Furniture of a House.

HERE is the Hawaiian house, plain, no ornament, seldom a garden around it, none,—not even a trace,—of the elaborate carving of the Maori, nor the fantastic roof-work of the New Guinea or Solomon Islanders, a shelter surely but not yet a home, and that long distance between house and home so well known to the Anglo-Saxon is wonderfully shortened here in the tropics. Yet the Hawaiian recognizes the difference: the empty house, however convenient, however well built, has something dismal, even uncanny, and the belief of the untutored Carib, derided by the thoughtless, is natural and reasonable. He thinks that an unfinished house,—unfinished until it is inhabited by articles of domestic use, if not by human beings, is the chosen retreat of the devil, and the builders when they leave their work each night, place a simple wooden cross at the door and window openings. The devil is easier to keep out than to get out!

Centuries ago among the hills of Palestine, we get a glimpse of the same belief. "Then he saith, I will return into my house whence I came out; and when he is come, he findeth it *empty*, swept and garnished. Then goeth he and taketh with himself seven other spirits more evil than himself, and they enter in and dwell there."

Something of the same feeling prevails among the Polynesians, and the consecration ceremonies held before a new house is occupied always, I think, include a prayer that the evil spirits that may have entered the empty house, may be forever banished by the happy human life about to dwell in it.

We have seen the Hawaiian cut the last tuft of grass on the thatch, over the door-lintel and that bit of grass was symbolic not merely of the last touch of the builder, but a warning to any evil-disposed *akua* to keep out. When that tuft was cut and the kahuna had asked the blessing of the gods, the great gods and the lesser gods and the whole forty thousand gods, the owner and his family entered in with their belongings: a good and happy family is the best talisman, I know of, to keep evil spirits (or thoughts) at a distance.

We consulted David Malo in the building of the house and we may do the same in the furnishing, but the picture he gives us is not wholly a pleasant one, and we may suspect that he, perhaps unconsciously, contrasts the former state of his country-men with that newer civilization then knocking at the door. We know that in the houses of the alii there were, even in remote days, many things he takes no notice of in his brief story, and after his account we may turn to other sources of information.

EXTRACTS FROM CHAPTER XXXIII OF MALO'S ANTIQUITIES.

20. Oo ka ipu kekahi mea e pono ai maloko olaila e hahao ai ka ai, ka ia o ko Hawaii nei mau ipu kahiko mai elua ipu he ipu laau, he ipu pohue.

21. O ka poe akamai i ke kalai ipu kalai no lakou i ipu ma kekahi laau, aka, o ke kou ka laau kalai nuiia i ipu, e kalaiia na pauku laau mawaho, a hooliloia i umeke kekahi, a i ipukai, a e pao maloko a hohonu a e hana palanai kekahi i ka laau maluna o ka ipukai, a pau ia hana ana.

22. Alaila, e anai i ka puna maloko a mawaho, a pau ia, alaila anai hou i ke oahi, a pau ia anai i ka ana, a pau ia, anai i ka oio, a pau ia, anai i ka nanahu, a pau ia, o ka lauohe, a pau ia, lohi aku ka lauhuhu me ke kapa, o ka ipu iho la noia, e hana i poi a i koko, ma ka umeke ka ai, ma ka ipukai ka ia.

23. O ke pohue, he ipu ia i kanuia a hua mai, nana no i hua mai ma ke ano umeke, a me ke ano ipukai, a me ke ano huewai, he awaawa maloko oia ipu, he awaawa ole kekahi ipu, e wau ka pala maloko a pau, a kaulai maloo, anai a pau o loko o ka ipu, iho la noia, e hana i poi, i koko mawaho o ka ipu.

24. E hoopala ka hue, a hahao i iliili maloko, a lulu a pau ka pala, a ku i ka wai a manalo, oia ka huewai.

25. O ka paakai kekahi mea e pono ai he mea e ono ai ka ia a me ke koekoe o ka paina ana, he mea hanaia ke paakai ma kekahi aina, aole i hanaia ma kekahi aina o ke kai ma kai e kii aku no ka wahine, a lawe mai ma ke poi, a he kai hooholo ia mai kekahi ma kauwahi mai.

26. E waiho kela kai ma kekahi poho paha, he ekaha paha, he kaheka paha, alia malaila lawe ho ma kauwahi e, o ka paakai iho la noia, o ka papalaau ka mea kui poi.

27. O ka wai kekahi mea e pono ai he mea kii wale aku ka wai ma kahawai, he mea eliia

20. The calabash was a good thing in which to put food and fish in the old Hawaiian house, and these were of two kinds, the wooden and those formed from a gourd.

21. Those who were skilled in carving bowls carved them from this and that wood, but kou was most commonly used; it was cut in blocks and first shaped outside, an umeke this, an ipukai that; it was dug out deep within for the former, shallow for the latter; a cover was made for the ipukai and the work was done.

22. Then with coral was the inside and the outside rubbed smooth; this done the rubbing was repeated with polishing stone and pumice; then was used charcoal and bambu leaf, and finally banana leaf and kapa. After this the bowl is provided with a koko. The umeke is for poi, the ipukai for meat.

23. The ipu was the fruit of a vine that was cultivated, and the fruit was worked in the shape of an umeke, an ipukai or a huewai. Bitter within were such gourds, others were not bitter. The soft inside was scraped out and the shell dried; when dry it was rubbed inside, a cover made and a koko.

24. The water-gourd was rotted, then small stones were put in and shaken until the soft mass was removed, then water was left in it until it was tasteless, and the huewai was done.

25. Salt was an article proper for the house; it was used for preserving fish, in cooking food, and at meals. Salt was made not here and there but in certain places where the women brought sea-water in the covers of calabashes or led it in ditches to shallow ponds.

26. Such water was left in holes perhaps, in shallow ponds perhaps, until it became strong brine, then it was taken to crystallizing pans where it became salt and was pounded on a board like poi.

27. Water was a necessary thing that was brought from springs or streams, or dug for in

kekahi wai. O ka wai kekahi mea e pono ai ka paina ana, no na puna, a me ka wela o ka paina ana.

28. O ka ai, o ka ia, o ka paakai, a me ka wai, o keia mau mea ka mea e pono ai ko loko o ke kanaka.

29. O ka niho mano ko Hawaii nei mea e ako ai e ka lauoho. Ua kapaia he niho ako lauoho. E hoa ka niho mano ma ka laau a paa, a pepelu mai a ka lauoho maluna o ka niho mano, a malalo o ka niho mano, alaila, o aku imua me heunuunu la ke ano, a i eha loa e puhipuhi i ke ahi, oia ka lua o ka mea ako lauoho.

30. O ka Hawaii nei aniani kahiko, he papalaau, e anai a maikai, alaila, paele i ka hili, a paele hou i ka lepo, a eleele a hou i ka wai, alaila, nana aku, he wahi ike pohihi no, he pohaku kekahi aniani, e anai a hou i ka wai, alaila, nana aku.

31. O ka launiu ko Hawaii nei peahi kahiko, e ulana a palahalaha o ka loulu kekahi peahi, he peahi maikai ia, e hanaia ke kumu i ka aha. O keia mau mea no na mea i pono ai ko ka poe kahiko noho ana ma Hawaii nei. (Aloha ina lakou!)

the ground. This water was a good thing at meals to prevent choking and to cool hot food.

28. Vegetables and meat, salt, and fresh water, all these things are necessary for the inner man.

29. A shark's tooth was used in Hawaii for hair-cutting. It was called *niho-ako-lauoho*. The shark's tooth was fastened to a wooden handle; the hair was doubled over the shark's tooth, then this was pushed quickly forward while the person shrank back with the pain; some burned it off with fire; such was the second way of hair-cutting.

30. The ancient looking-glass of Hawaii nei was of wood well polished, then dyed black with bark, again dyed with mud and blackened with water, then gazing at it a faint image appears. Stone carefully polished was dipped in water and then reflected the image.

31. The coconut leaf was the ancient fan of Hawaii; it was braided flat; the loulu was also used; a good fan was that, and the handle was wound with coconut cord. Such were the possessions of the old-time people who dwelt in Hawaii nei. Great pity for them!

With the native account as a text we may wander away to a consideration of what these "belongings" really were, and we may either take the most primitive to begin with and in our imagination build up little by little the necessary utensils of a poor man's home, or we can collect all the things we know the Hawaiian used, stock his house generously, and leave each reader to subtract what seems luxury from the bare necessities of life with a primitive man, or for the matter of that with a modern poor man. I have chosen the latter procedure, and although I shall try to describe all that a well-to-do man, a chief, one of the *alii* had in his home before the second advent of the white man at the time of Captain Cook's visit, I will also indicate in some measure what I believe the order of acquisition. Let us limit ourselves to the belongings of household life, reserving the worship, the food and amusements for other chapters.

One thing will be very apparent, there was very little for exhibition or ornament; everywhere utility reigned. There was no endeavor to harmonize the carpets with the wall coverings, or the furniture with both. And yet that very thing was done unconsciously, for the mats that covered the stone, earthen or gravel floor matched perfectly with the grass or hala leaf lining of the walls, and the dark gray of the stone implements and the orange of the gourd containers with the deeper colors of the umeke struck no discordant note. It is useless to say that if it had no eye would have been offended in the dimly lighted interior; almost all the furniture was used out of doors and only stored within; but whether placed by the brookside under the trees, in the lanai, or piled up on the gray stone platform around, or at least in front of the house, there was not a shining tin pan or kettle, nor a vilely decorated bit of crockery (as so often in modern degenerate times) to offend good taste; everything harmonized as commonly with the uncorrupted children of the simple life.

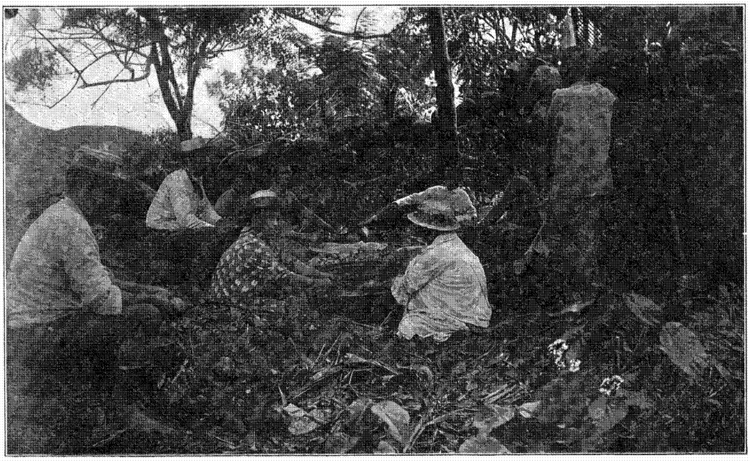


FIG. 100. POI MAKING OUT OF DOORS. A SCENE AT HALAWA, MOLOKAI, IN 1888.

The universal out-of-door life in the fine climate of Hawaii kept the house clean and permitted the use of a floor covering of mats of fine texture; much better these than the rushes strewn upon the floors of our Anglo-Saxon ancestors. These mats have already been described in the publications of this Museum,[63] and it need only be repeated here that in the better houses the actual floor was covered with several layers of mats, sometimes all of pandanus leaf but in fineness increasing from the bottom layer, at other times the lower ones were of pandanus and the upper one of *makaloa*, a fine rush of which the best and most durable Hawaiian mats were made. On the general coarser mat covering of the floor was often placed the bed or *hikiee*, a structure of mats interleaved with extra strips of matting at the front edge, and often extending the length of the one room of the sleeping house. Sometimes this hikiee was placed on a slightly raised platform or kahua like an oriental divan, but I believe this a comparatively modern innovation. I have never seen such a kahua in the ruins of the old houses that are dotted over the group. All the family and guests slept together on this long bed which often was more capacious than the famous bed of Ware, and not infrequently the pet pig of the family joined the company of sleepers.

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[63] Hawaiian Mat and Basket Weaving. Memoirs ii, pt. 1, 1906.

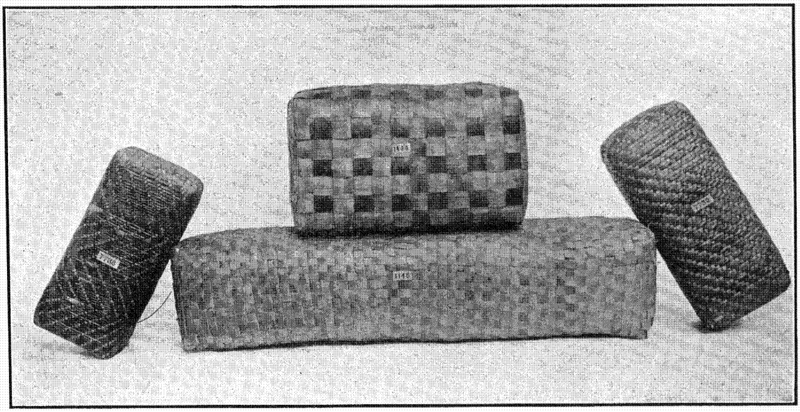

FIG. 101. ULUNA OR PILLOWS.

Uluna or Pillows they had, as shown in Fig. 101, woven of smooth pandanus leaves, and stuffed with other leaves, most comfortable even for an European. As the illustration shows these pillows were sometimes of ornamental weaving, but they commonly were plain and of various sizes to suit the owner or user. In the earlier houses the expedient sometimes seen in poorer houses of later times of a log or bolster, extending the length of the hikiee was no doubt common. They had also a wooden pillow, as Malo says, but I do not know of an example extant, nor have I ever seen one in use in a native house. A stone pillow was found some time ago at Kilauea, Kauai, a locality noted for its good stone work, and this may have resembled the wooden one. The stone one is shown in Fig. 102. It is cool and not so uncomfortable as might be inferred from its material[64] The body is flat on the outside and convex on the body side; the legs are slightly notched to prevent slipping on the smooth surface of a mat bed. I know of no other specimen of the stone pillow; only the frail mat pillows have survived to the present time.

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[64] This uluna pohaku was kindly loaned me for examination and to photograph by the owner, Mr. J. R. Myers, of Kilauea Plantation.

Kapa Moe.—They also had bed clothes (*kapa moe*) of the paper made by felting the fibres of the paper mulberry into large sheets, five of which usually formed a *kuina* and were stitched together with a tape of kapa at one edge leaving the others free. The sheets were of an average size of six by eight feet, but there is one in this Museum ten and a half feet by twelve, and others nearly as large. Four of the kuina or set of sheets were generally white or yellow, while the outside sheet (*kilohana*) was colored or decorated with imprinted figures or lines. Such a kuina was quite warm, and I have found them unbearable over my ordinary clothes when sleeping on the summit of Mauna Loa (13,675 ft.) when water was freezing at my feet. The Hawaiians of the olden time were clothed only in the *malo*, a strip of kapa or matting perhaps nine inches wide and two yards long; this with the women became a *pa'u* which was about a yard wide and of considerable length; neither sex wore night clothes. Both sexes, however, used in cold weather a shawl of kapa called *kihei*. Some authors have stated that the Hawaiians wrapped themselves in the kapa moe in sleeping, and I have seen them go to the door of their house on a chilly night in the mountain region wrapped in it as a white man might use a blanket, but while it is quite probable that they had individual peculiarities in the matter, those I have consulted have generally slept with the *kapa moe* over them in the usual manner of bed coverings. Precisely in this way those who slept the last sleep were covered by a sheet of black kapa, and one recalls the message sent by the last king of Kauai to the conquering Kamehameha,

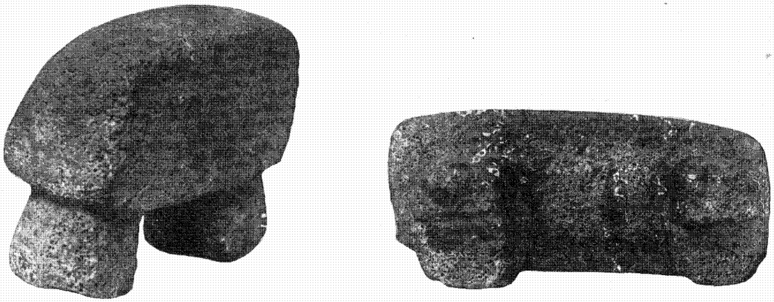

FIG. 102. STONE PILLOW FROM KILAUEA, KAUAI.

"Wait until the black kapa covers me and my kingdom shall be yours." I cannot here follow up the manufacture of kapa, which will require a chapter by itself,[65] but the chief implements used in this most important work were a part of the furniture of every important house, and must be briefly described and illustrated here.

No loom nor complicated machinery was needed for the simple process by which the fibres of bark were converted into sheets of varying size and consistency. A log of some hard wood, usually of *kawau* or *kolea* wood, was cut to a length of about six feet, hewn to a flat surface about three inches wide at top, cut away slightly at either end and hollowed out longitudinally underneath. This anvil, *laau kui kapa* or *kua kapa*, was supported on two stones. Fig. 104. A variety of hand clubs, some round (*hohoa*) for the first beating, or square (*ie kuku*, Fig. 103) for the finishing, and a few calabashes to hold water or some mucilaginous liquid, were all the tools needed to make what was probably called from the means used in its fabrication Kapa = *ka pa*, the beaten.

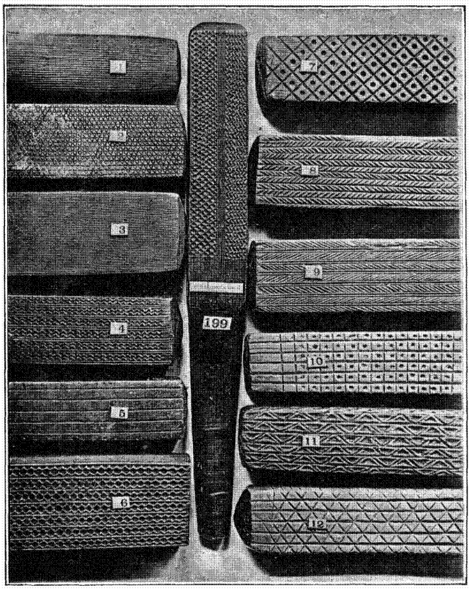

FIG. 103. KAPA BEATERS.

In olden time the kapa beating was done in one of the six houses (hale kua) of a well-to-do Hawaiian, but in later times I have usually seen the old women establish their *kua kuku* under some tree near a brook or kalo patch. The patterns on the beaters were various and these determined the "water mark" on the kapa: the form of the beater and some of the patterns are shown in Fig. 103. These beaters are perhaps the most common Hawaiian article in museums, and they must have been very abundant, as after their original use had become obsolete, scores were used up in trying to reduce to fibre the foreigner's clothing in their primitive process of washing by beating the wet fabrics on a flat stone.

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[65] I more willingly pass over the very important work of kapa making without a complete description because a rather lengthy memoir devoted to that manufacture, in which the Hawaiians excelled, is in preparation and will be fully illustrated with photographs and colored plates.

As there were no mosquitoes on the Hawaiian Islands before 1827, the old natives had no need of mosquito nettings so indispensible in the southern islands of the Pacific, and the *tainamu* of the Samoan was not known on Hawaii in the "good old times". Sleep was often broken to go to the *poi umeke*[66] and satisfy their frequent hunger. In the day time the kapa moe were carefully folded and put aside as were the mat beds of the Samoans. The author can bear witness to the great comfort and restfulness of this old Hawaiian mat bed and pillow in a new and clean house, and it is no wonder that modern Hawaiians who have frame houses after the foreign style and bedsteads and other foreign furniture, still prefer to sleep on their mat bed *under* the cumbersome foreign bedstead. Once the author, in passing the night in such a house in a fine four-poster with mosquito nettings, was awakened at daybreak by a slight noise and saw his host and hostess crawling carefully out from beneath the bedstead, where they had comfortably passed the night.

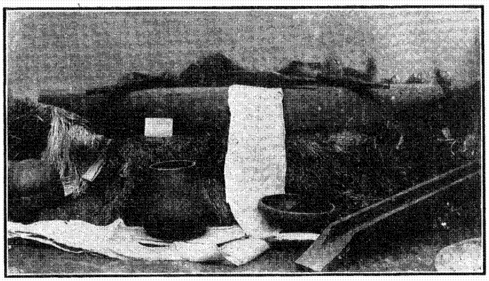

FIG. 104. LAAU KUI KAPA.

When foreign customs began to be observed, partitions were made temporarily in the one room of a native house by sheets of kapa hung on cords. When traveling here in the early sixties with ladies this convenience was generally offered by our obliging hosts; often this was the sole exception to the antique *modus vivendi*, and yet it made the little one-roomed house seem very foreign to have this fence rather than partition stretched from wall to wall. It destroyed the extreme sociability of the old Hawaiian way.

Before we turn from the subject of bed and its use, we may describe a custom rather than the apparatus, that to old residents seems almost a part of the native house; and yet today the articles I am about to describe (Fig. 105) are hard to find, and not many have been preserved in museums. If Morpheus or his Hawaiian equivalent refused to be propitious, and sleep was coy, the old natives had a soporific always sure and never harmful.

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[66] Poi umeke = the bread basket. Poi was the paste made from the cooked root of the kalo, and was the staff of life to the Hawaiian. Its manufacture and modifications will be described in the chapter on the food and cookery of the Hawaiians.

Laau Lomilomi Kua. Back Rubbers.—Obesity being a much coveted condition among certain chiefs of either sex, although perhaps more among the females, eating in excess of the requirements of a natural appetite was resorted to and in consequence some passive exercise was needful to digestion, and the delightful process of *lomilomi* or massage was applied to the fat masses of poi, fish and dog. But not merely by gluttons, but by the muscle-weary was this process indulged in. Constipation, headache and many other ills yielded to the skilful manipulation of the old women who were reputed the best operators.

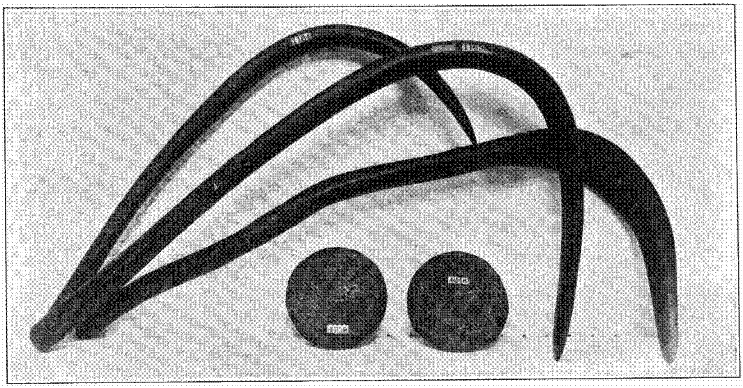

FIG. 105. LAAU LOMILOMI AND BATH RUBBERS.

I am not copying what is usually said of a Hawaiian lomilomi; I know of it intimately by repeated personal trials. Once I had been in the saddle all day on a slow horse traveling the then execrable trail from Hilo to the volcano of Kilauea in a rainy season. Arrived late at night at the grass house that then served to shelter visitors at the brink of the crater, I dismounted so stiff and weary that I could not sleep, I could hardly sit down. Fortunately there were then many natives living in that desolate neighborhood employed in the long since abandoned work of *pulu* gathering (pulu being the silky down at the base of the frond of the tree fern of the neighboring forest, the product being then in demand for stuffing pillows and beds), and among them were found two old women noted for their skill. I removed all unnecessary clothing, dropped on the mat, and the lomilomi began. At first they gently kneaded the muscle from the extremity to the trunk, then tapping in succession with finger tips, knuckles and closed fists, and ending with a minuet danced on my abdomen, and a march on their heels up and down my spine. I think they, in the course of this, ran their heels down every rib as if it were the key of a piano. They also "cracked" each finger joint and even my neck; at first it was ticklish; then dreamy; then restful, and after an hour of this I got up so refreshed that I could have ridden all night. Instead I at once fell asleep.

Foreigners have learned the process to some extent, but the old native *poe lomilomi* are extinct.[67] On the whole I consider the old Hawaiian lomilomi far pleasanter than the massage that one gets from the most approved operators in the best baths in Cairo. At times one might wish to exercise his back, and without assistance at hand, the laau lomilomi shown in Fig. 105 were most useful, and were found in every house in the olden time. In a grass house where there are no door posts, they were certainly a great addition to the comfort of the *human* inhabitant. In the Bishop Museum these sticks are placed in the medical alcove, where they belong, but they always seem a necessary part of the furnishing of a hale pili. The round stone rubbers shown in the same illustration, were of cellular lava, and in the ablutions took the place of the then unknown soap. It was sometimes well to use them after a lomilomi.

The specimens of laau lomilomi kua in this Museum are as follows:

1163	Of kou wood, large.
1164	
1165	
1166	Of kauila wood; from Kalihi, Oahu.
1167	From Honaunau, Hawaii.
1168	Of nenelaau wood, Kailua, Hawaii.
1169	Kona, Hawaii.
1170	Kona, Hawaii.
1171	Kona, Hawaii.
1172	Kona, Hawaii.
1173	Kona, Hawaii.
1174	Of ulei wood; N. Kona, Hawaii.
1175	Of nenelaau wood; Kailua, Hawaii.
1176	
1177	

If my native house had at this time human inhabitants, my reader might justly say that I had put them to bed not only without their supper, but without a light! While the chapter on Food might be appealed to for the supper, it would be unfair to leave out the light for while the old Hawaiians often went to bed with the chickens, they did not like the dark more than other Polynesians, indeed than children of any race. In the cooler parts of the country the fireplace was fed with slow-burning fuel for a dim glow, for which the *mamane* (*Sophora chrysophylla*), a tree common on the uplands, was most fit. Torches (*lamaku*) were made by stringing the meats of roasted kukuinuts (*Aleurites moluccana*) on the midrib of a coconut leaflet and binding a number of these strings with dry banana leaves into a cylinder some six inches in diameter, and from two to four feet long. This lamaku produced a bright light, convenient for a night-time dance or revel, but it gave out too much smoke to be tolerated in the ill-ventilated houses, although the glow was pleasant through the open door. The usual evening light for the interior was the stone lamp fed with kukui oil and supplied with one or more wicks of twisted strip of kapa, or with the older and simpler candle of these same nuts first roasted and shelled and then strung as in the torch but in shorter lengths. Such candles it was the duty of the younger members of the family to care for, and they were "snuffed" by inverting the candle until the next nut was alight and then knocking off the embers of the spent nut. The odor was strong, resembling that of roasting peanuts, and care had to be taken that the half extinguished coal did not set the mat carpet afire. As shown in Fig. 106 the same stone lamp that held the oil could also be used for candlestick for the nut candles.

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[67] On camping excursions I have often applied this massage to the relief of my companions, and Judge Sanford B. Dole, president of the trustees of this Museum, is very skilful in this Hawaiian art.

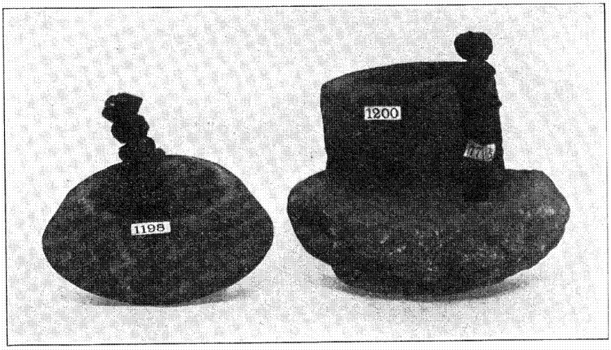

FIG. 106. KUKUINUT CANDLES.

The lamps were of many forms, not very portable but durable beyond most modern lamps. Their forms are shown in Fig. 107 and others are described in the already published account of Hawaiian Stone Implements.[68] The oil was ground out of the nuts in stone mortars many of which are figured in the same work (p. 366), and all important houses had one or more of these, as the oil was home-made. Fig. 108 shows a common form of mortar, but some were of considerable size and good workmanship. Usually the stone pestles were neither so large nor so neatly finished as those of the Amerind, but then the latter had greater use for the implement in grinding meal for his bread. Although the nut season was a long one there were times when the supply must have failed these improvident children of nature, and the fat of a pig or a dog served as substitute.

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[68] Memoirs of B. B. Bishop Museum, vol. i, pt. 4, p. 391.

Doubtless a chief had many adzes, slingstones, clubs, sinkers and many other stone implements about his house, but these have been described in the work referred to, and we can only here call particular attention to the poi pounders which from their continued use seem to connect us with the stone age, as they were among the earliest tools fashioned by the Hawaiian immigrant on his arrival in these islands. His nearest patterns were in Central and South America. Their various forms are shown in Fig. 109 here repeated from the account of the stone implements as it shows the difference between pestles and pounders: the latter had no stone mortar to grind against, but were used on a flat and shallow wooden trough, which, when not in use generally leaned against the outer wall of the house and was plainly visible from a distance.

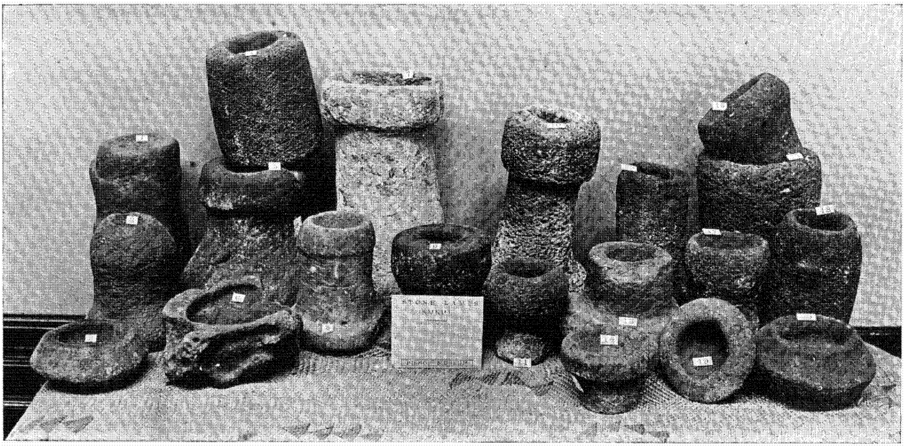

FIG. 107. STONE LAMPS.

These poi troughs (*papa kui poi*) were hewn from some tough wood, as ohia (*Metrosideros polymorpha*),[69] and are either of small size for convenience in traveling, when the alii always, if possible, had their attendants carry all the requirements for making poi, or if for home use of sufficient size to serve two persons pounding, one at either end and each with his own portion of kalo. A very old poi board in the Bishop

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[69] In modern times the natives and Chinese make much use of the softer wood of the Monkey-pod (*Pithecolobium siamang*).

Museum, Fig. 110, is of an irregular circular form, thirty-nine inches in the greatest diameter, while in the same collection another which can boast of less antiquity, but of the most approved form is sixty-five inches long and twenty-three and a half inches wide. As the stone pounder struck the elastic mass of poi and not the trough, this lasted through several generations of poi makers. At present most of the poi consumed in Honolulu is made by the industrious Chinese or at the poi factory where modern machinery and methods are used in Kalihi.

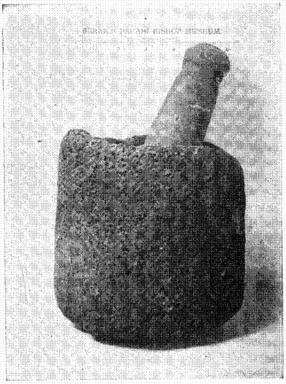

FIG. 108. STONE MORTAR.

Although in the enumeration of the houses of an Hawaiian alii's establishment no mention was made of carriage house or barn, yet they all kept a carriage, though of the most primitive form. In war the *pololu*, a long stick of kauila wood, formed the carriage of the commissary department and went to battle, the ends resting on the shoulders of two men while the length was hung with neat bundles of hard poi (*paiai*) wrapped in ki leaves. If the chief fell in battle his retainers endeavored to save his body and carry it home slung by the wrists and ankles to this pololu. If he returned triumphant the pololu, which was often more than five yards long, was set up in front of his house as in later days a flag staff would be planted. That these carriages were held in respect let me quote the record attached to one in the Bishop Museum (No. 804): "The tree grew at Puukapele, Kauai, from which this spear was made for Kamehameha I, who gave it to his soldier and aikane Hema just before the battle of Mukuohai fought against Kiwalaó. Hema also used it in six other important battles, viz., at Laupahoehoe against Keoua Kuahuula; in a sea fight in the Moana o Alanuihaha against Kahekili and Kaeo; at the battle of Iao against Kahekili and Kaleikupule; in the battle of Kanaawa at Hilo, Hawaii, against Namakeha; at Keaau, Puna, in the excursion of Kaleleiki; at Kaunakakai, Molokai, againt Kaleikupule. In the peaceful times that followed the conquests of Kamehameha the old spear was trimmed into an *auamo aipuupuu* and used to carry the calabashes of the alii." Let us see what the less renowned auamo were like.

Auamo.—To carry the gourds, umekes and other similar burdens poles were used, made of some tough wood, slightly bent and more or less notched at the ends. In Weber's picture of the newly discovered village at the mouth of the Waimea river

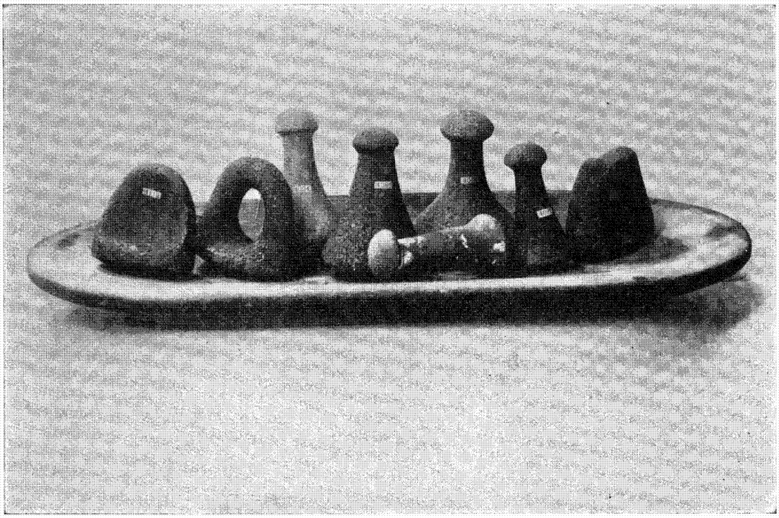

FIG. 109. POI BOARD AND POUNDERS.

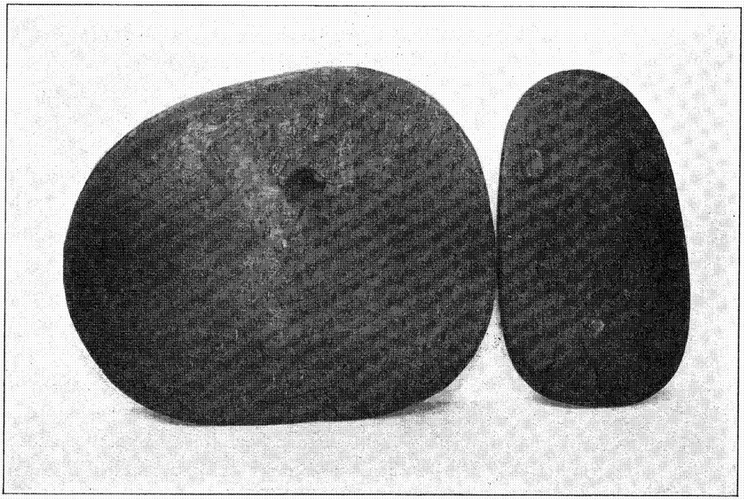

FIG. 110. POI BOARDS.

on Kauai, two natives are seen carrying a live pig slung on a straight pole resting on their shoulders, and in the old songs there are references to this bearing stick generations before Cook's visit. The section of an auamo was generally, if not always, circular, and not well fitted to rest easily on the bare shoulder; hence a porter was known by the callus formed at the point of contact.[70] These bearing sticks were also known as *aumaka* or *mamaka*. The Hawaiian sometimes used a straight round pole pointed at both ends for one especial purpose,—to meet the demands of foreigners for hay, an article not imported in the period previous to 1865. The native hay dealer skilfully packed two long bundles of grass in such a way as to seem of considerable bulk, but often containing but little grass. These he transfixed with his pointed pole and brought into market as shown in Fig. 112. Probably none of the present generation of Hawaiians ever saw these bundles, but I think I remember one native who brought me grass for my horse in Honolulu, using a genuine China stick.

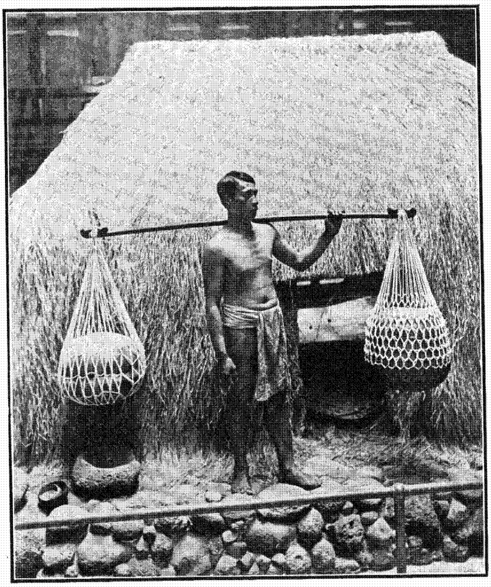

FIG. 111. BEARING THE POI OF AN ALII.

Of course a well-to-do man or a chief did not use auamo, but he had to provide them for his servants, and the specimens existing in this Museum show that more care was expended upon these implements than would be expected of mere porters. Fig. 113 shows the ends of some of these auamo, and the following list gives their material and length:—

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[70] The bearing stick of the Chinese is much better suited for the purpose having a broad, almost flat surface where it rests upon the shoulder and is without notches, although sometimes one or two pins were inserted to answer the same purpose as notches. It is easy enough to keep the suspended baskets from slipping off in the flat country of China, or of most Chinese towns, but the Hawaiian had to climb most difficult paths in his native islands, and it would often be impossible to keep the pole perfectly horizontal. The Chinese poles were early introduced (before Vancouver) but were not copied by the Hawaiian. A good "China stick" is six feet long; two inches wide at each end and at the middle, tapering between these points; is one and a quarter inches thick at the middle and weighs only three pounds.

LIST OF AUAMO IN THE BISHOP MUSEUM.

144 Auamo kii of kauila wood well carved with two human heads at each end. Made by Kipolo during the reign of Kamehameha III (d. 1854). 72.5 in. long; weighs 3.5 lbs. G in Fig. 113.

145 Auamo kii with two rudely carved human heads at each end. From Queen Emma's collection. 97.5 in. E.

146 Auamo kii with a head and three teeth at each end; the head perhaps of an akua. 69 in. D.

147 Auamo of ulei wood with three notches at each end. From S. Kona, Hawaii. 41 in. F.

148 Auamo of kauila; one notch. 45 in.

149 Auamo of koa, very old. 49 in.

150 Auamo of guava wood. Made by Kapela of Keauhou, S. Kona, Hawaii. 37.5 in. B.

151 Auamo of ulei with two notches at each end. 62 in.

152 Auamo of kauila wood. From Queen Emma's collection. 61.5 in.

153 Auamo of ulei. From Kau, Hawaii. 44.5 in.

154 Auamo. 43.5 in.

6695 Auamo of kauila wood. Ailau collection. 46.5 in.

7595 Auamo of kauila. 61.7 in. C.

9475 Auamo with projecting notch. 51 in.

9521 Auamo of akia (?) wood. 61 in.; weighs 4.5 lbs. A.

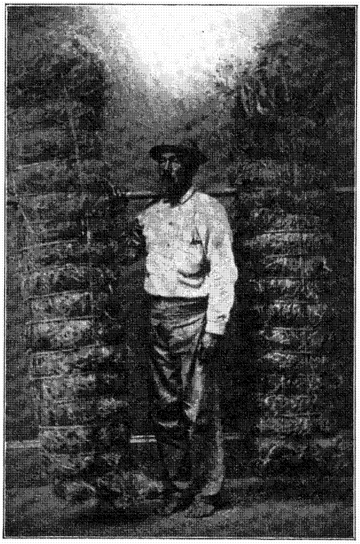

FIG. 112. HAWAIIAN HAY DEALER IN 1864.

9522 Auamo much bowed. 46.7 in.

9523 Auamo round and tapering. 46.5 in.

9524 Auamo of light wood, notch wide, raised. 49 in.

9525 Auamo of light wood, notch slightly raised. 49.5 in.

9526 Auamo of very light wood, one end mended. 44 in.

9527 Auamo of kauila, notch cut in. 54.5 in.

9528 Auamo, smooth and old, one end broken. 47 in.

9529 Auamo of kauila, slight notch. 46.5 in.

Gourds as Containers.—No Hawaiian laid up food for future use: he had not acquired the domestic economy of the Marquesan or the Kusaien who prepare food from the breadfruit or the pandanus during the seasons of plenty for the needs of other times. He had, however, to prepare his poi some time before a fermentation made it palatable, hence a number of containers were needed, and in most families there was a a never-failing supply of this national bread. Containers were needed, and the earliest, probably were the gourd shells, *ipu* of the natives, since this name has attached to vessels made for many generations of wood, as we shall see later, and even to the stone lamps (*ipu kukui*). The large gourd (*Curcubita maxima*), *ipu nui* of the natives, was found on this group at the time of Cook's visit, although unknown to other Polynesians, and of unknown derivation. Its huge fruits are sometimes several feet in diameter, the rind thin and strong, and serve not only for bowls and dishes, but also for traveling trunks (Fig. 114), for which purpose they were well adapted by their toughness, lightness and impermeability to rain. Slung in the network *koko* from the auamo on the shoulder of a stout, active Hawaiian they have often accompanied the writer on mountain trails, one of the pair containing food, the other a change of raiment, while the bottle gourd in the middle carried water, often so hard to find good in mountain climbing on Hawaii.

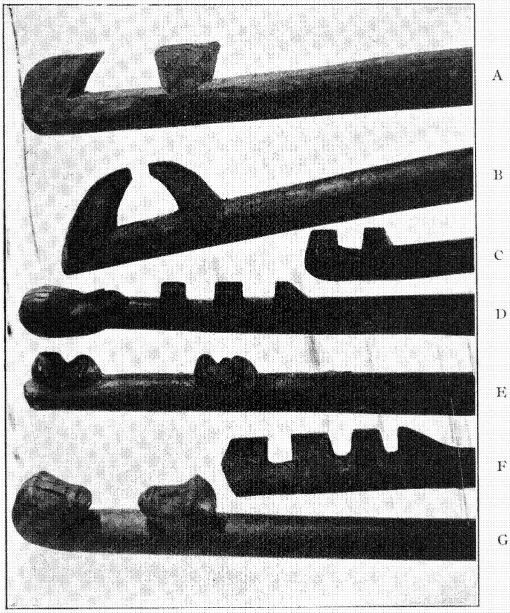

FIG. 113. ENDS OF HAWAIIAN AUAMO IN THE BISHOP MUSEUM.

As these gourds were on the islands or brought by the early immigrants, they were perhaps the first material at hand for containers, and they were certainly used widely and in many ways. They were always what took the place of crockery with

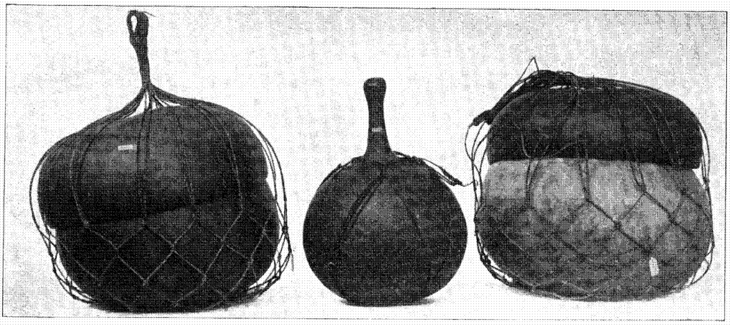

FIG. 114. GOURD CONTAINERS.

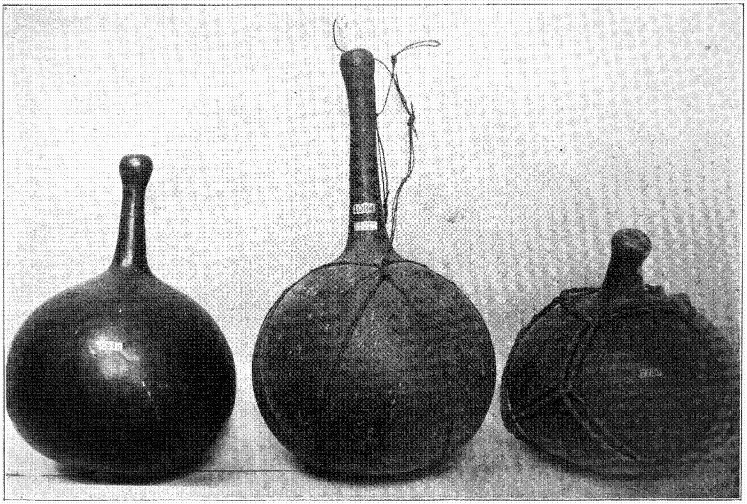

FIG. 115. BOTTLE-GOURD: HUEWAI.

the poorer folk, and with these they hold the same place today in the country regions. If the immigrants brought the seeds of this vegetable, as well as the coconut, with them their canoes must have had the capacity for freight that is fabulously imputed to the Mayflower. In the case of the gourd, while not emulating Jonah's, only a few months would be required to renew the supply, while the coconut, the only other source of containers, cups or bottles, would require twelve to fourteen years before fruiting: the latter vegetable pottery they used to an extent second only to the gourd.

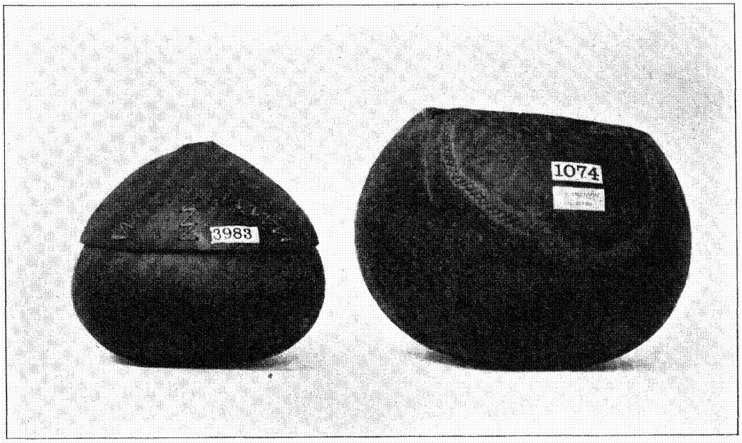

FIG. 116. MENDED IPU.

Besides the large Curcubita the Hawaiians had also the bottle-gourd (*Lagenaria vulgaris*), a vine found over a much wider territory than its larger relative, and with the two they were not meanly provided with vessels for containing food and drink. Easy to prepare, the ipu were fragile, and we find them neatly repaired with great pains, when broken, for the threads of olonà which were to bind the fragments together must be twisted on the thigh in the Polynesian way,[71] for they had no spindle, a refinement that the dwellers in the palafittes in the Swiss and Italian lakes had used sixty centuries before. Then holes for the thread must be drilled in the easily penetrated substance, and for this they had the pump drill which is found all over the Pacific islands, in Papuan as well as Polynesian groups. We have seen its use in the coarser work of door framing, and we have in Fig. 116 two specimens of neat work on the more delicate substance. Today in the time spent in mending these vessels of comparatively little value, one could earn enough to buy a dozen new ones. Not so in ancient days, for time was abundant and most of the ancient vessels both of gourd and of wood were more or less patched: as we go on we shall see many of these.

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[71] See an illustration of this on p. 51, Vol. I, Memoirs of this Museum.

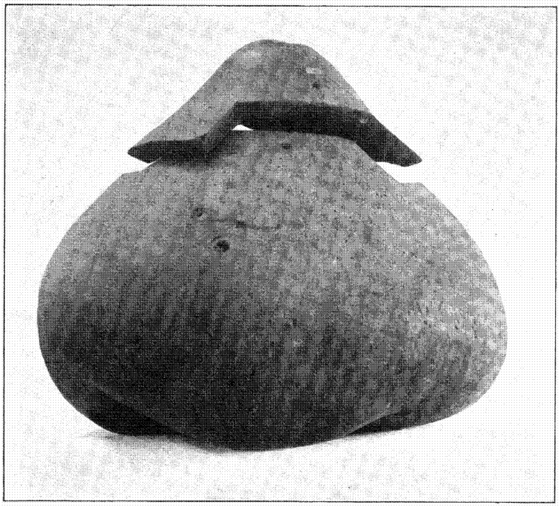

FIG. 117. GOURD BOX.

Of the Curcubita were made a great variety of things useful about a house as well as the large bowls. First were the covers for these bowls which also served as dishes when the bowls were uncovered, and the gourd covers were commonly used on the later bowls of wood. Long, narrow slices of these gourds made convenient platters, and fragments of broken ones were used for many purposes.

Gourd Boxes.—The thicker gourds were fashioned in such a way as to be tolerably tight so they could be used to store feather work or choice kapas. Such a box is shown in Fig. 117. This is 63 inches in circumference and 16 inches high, and it will be noticed that the cover is cut from the shell with two projections or wings, and this can be kept in place by cords passing through the drilled holes, two on each side. Such boxes were used for storage rather than traveling, in which the thinner gourds, illustrated in Fig. 114, were

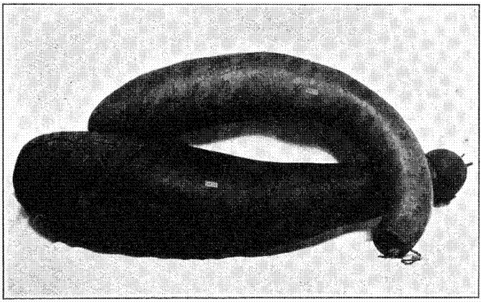

FIG. 118. LONG GOURD BOXES.

preferred. I do not know how the thick shelled varieties were produced, but the substance between the inner and outer skins is fairly dense, perhaps more so than in the thin varieties, which are often eaten by white ants which destroy nearly the whole median tissue.

Long thin varieties of this Curcubita were also used for storage of the feather capes and leis, and were sometimes so curved that they could be hung over a beam or rafter. Two of these long boxes, now in this Museum, are shown on Fig. 118. Gourds that were in form and size between the large bowls and these long boxes were in demand for hula drums (Fig. 119), and few houses of the alii were not provided with some of these popular instruments for beating time for the hula dance.

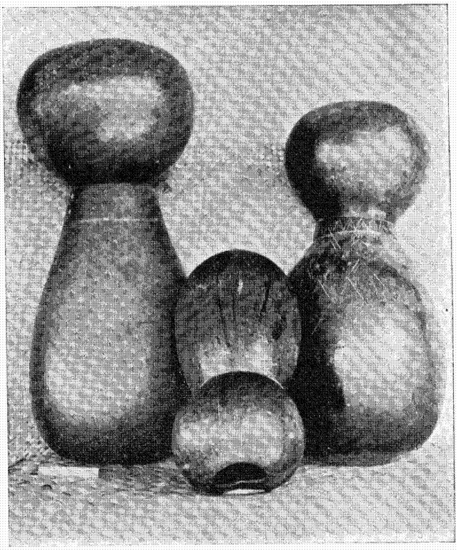

FIG. 119. GOURD HULA DRUMS.

From the bottle-gourds were made, besides the bottles, an endless variety of conveniences, some of which were so common as to demand notice, while others were local and trivial and may be passed by. But the bottles themselves varied greatly: there were the almost globular ones with a very short neck, handy on a journey; the long necked ones for household use, and the hour-glass shaped ones which were easily carried by a cord passed around the constriction, while the others had to be provided with a net or sling. The fishermen's huewai were long and almost without necks, that they might be laid on the bottom of the canoes out of the way. These are shown in Fig. 120. An unique form has been shown in a previous part of the Museum Memoirs,[72] in which compression had been applied to the growing gourd by means of a net, and the bulbous portion, to which alone the pressure was applied, was forced into round protuberances which, as may be seen by referring to the figure, were decidedly ornamental.

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[72] Old Hawaiian Carvings found in a Cave on the Island of Hawaii. Memoirs II, No. 2. The gourd bottle is figured on p. 17 (170) and here reproduced, Fig. 121.

To stop the mouth of a water bottle the Hawaiians used a Terebra shell, a small cachelot tooth, or a neatly folded palm or pandanus leaf fragment. To the present day these gourd bottles are in demand, although hard to find, for carrying water while on a mountain tramp, for they are light and keep the water cooler than the ordinary tin canteen.

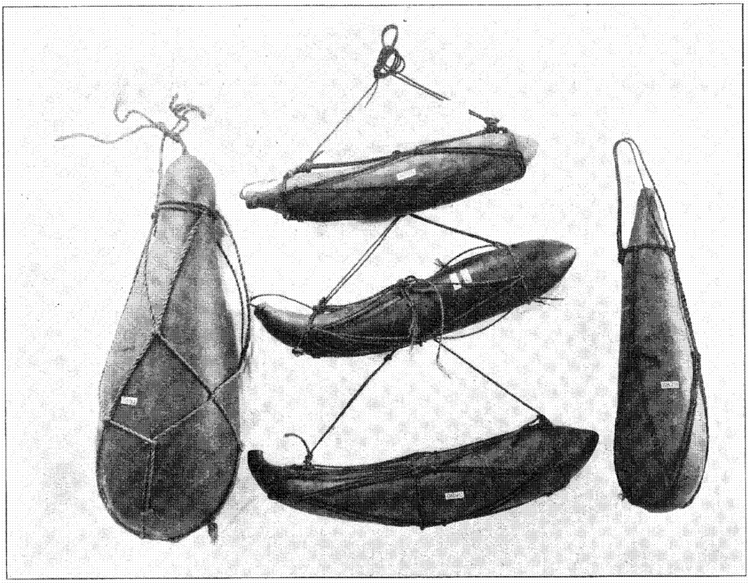

FIG. 120. GOURD WATER BOTTLES FOR CANOES.

Funnels.—The necks of the huewai are often so long and slender that one perforce admires the patience exercised in originally emptying the gourd through so long and restricted a passage: especially when it is remembered that after rotting the pulp and farther disintegrating the softer portions of the shell by shaking in it the small pebbles that took the place filled by shot in washing glass bottles, the whole resulting mass of pulp, pebbles and seeds had to pass out of an aperture often less than three-eighths of an inch in diameter. To fill such a bottle with water required a funnel, and the gourd furnished these of two general forms as shown in Fig. 122. One (1231) was a segment of a bottle, a little less than half, the lower part of the neck serving as spout; the other (1230) was a bottle with a disk removed from the bottom to form the mouth of the funnel. The first time I saw one of these bottles filled, however, was without any funnel. All along the coast of Oahu, east of Diamond Head, springs of fresh water are found below the sea level, and near Leahi one of considerable size and force of current exists. My native diver placed his thumb over the neck of his empty huewai, plunged into the sea and soon emerged with a bottle full of sweet water. The process used to be common before the Nuuanu waters were brought over the town of Honolulu.

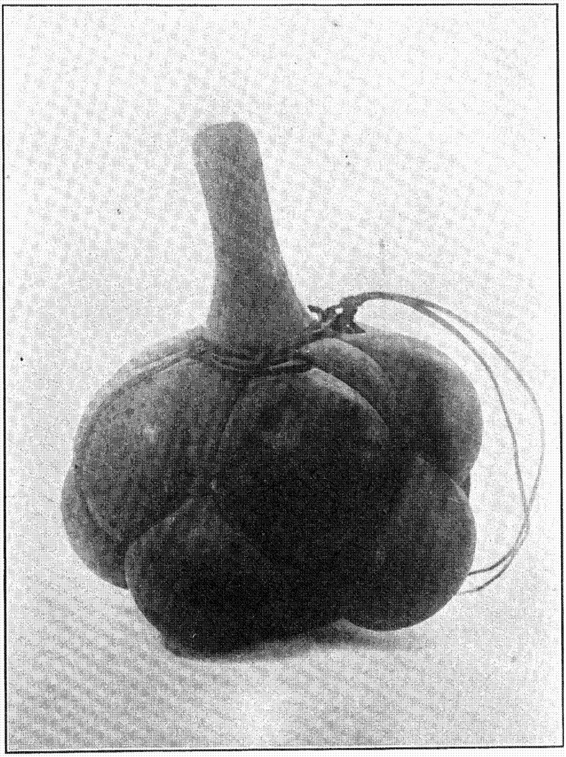

FIG. 121. COMPRESSED GOURD WATER BOTTLE.

Strainers.—Awa drinking was neither so universal on the Hawaiian Islands as on the southern groups, nor attended with so many ceremonies, but as the same process of chewing the peppery root and washing the masticated mass with water was followed, it was of course necessary to strain out the woody fibre from the green liquor, and there were three implements used as convenience served. First the funnel shown at the left in Fig. 122 could be partly filled with vegetable fibre and the liquor poured through this; second, a special strainer was made from a gourd bottle as shown in Fig. 123, the neck being loosely filled with fibre. The third was perhaps the most ancient form and was a coconut cup with the "eyes" enlarged slightly, as may be seen in the illustration of coconut cups, Fig. 128, upper cup.

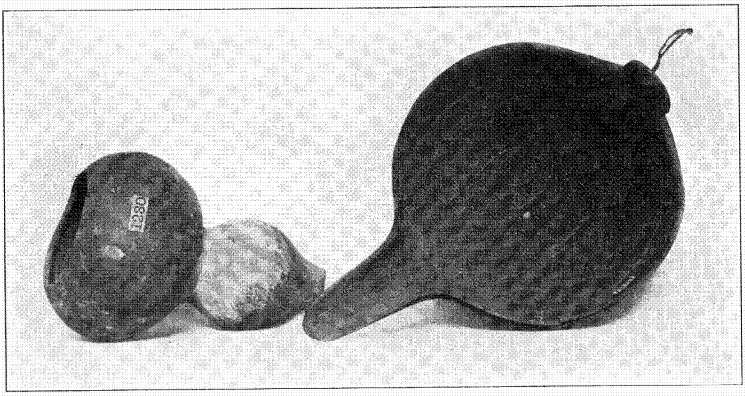

FIG. 122. GOURD FUNNELS.

Ipu Pawehe.—The instinct of surface decoration, rather Papuan than Polynesian, displayed itself on these gourd vessels as well as on the kapa or bark paper, and we have both *umeke pawehe* and *huewai pawehe*, bowls decorated and water bottles decorated: a fact that testifies to the esteem in which these fragile articles,—a sort of vegetable faience,—were held. Plate XXXVI will show the nature of this bichromatic design as applied to the umeke, in black and one of the various shades of orange-brown. In old specimens the orange is so deep that it is difficult, if not impossible to obtain by photography the distinction between pattern and ground, even with all the refinements of ray filters and plates especially sensitive to the orange rays.

The process by which this coloration was obtained was simple, but is variously described by the authors who have noticed the decoration. Malo's account we have given: my notes from the makers of huewai pawehe of half a century ago give it as follows: The portion to be left of the natural color of the gourd was covered with a varnish or glaze impervious to water, and the parts to be colored black were then scraped bare and the vessel immersed for a season in the mud of a kalo pond: a sort of etching process. I confess on examining some of the fine specimens in this Museum I do not see how this proceeding could produce such results, and I will quote from Rev. William Ellis:[73]

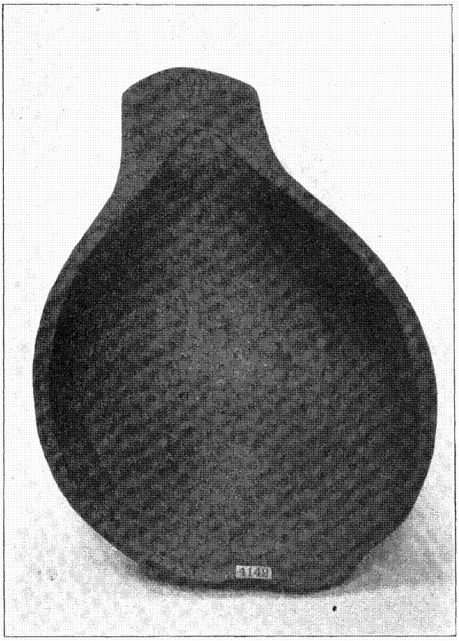

FIG. 123. GOURD AWA STRAINER.

> When the calabash is grown to its full size, they empty it in the usual manner, by placing it in the sun till the inside is decayed, and may be shaken out. The shell, which remains entire, except the small perforation made at the stalk for the purpose of discharging its contents, and serving as a mouth to the vessel, is, when the calabash is large, sometimes half an inch thick. In order to stain it, they mix several bruised herbs, principally the stalks and leaves of the arum, and a quantity of dark ferruginous earth, with water, and fill the vessel with it. They then draw with a piece of hard wood or stone on the outside of the calabash whatever figures they wish to ornament it with. These are various being either rhomboids, stars, circles, or wave and straight lines, in separate sections, or crossing each other at right angles, generally marked with a great degree of accuracy and taste. After this coloring matter has remained three or four days in the calabashes, they are put into a native oven[74] and baked. When they are taken out, all the parts previously marked appear beautifully brown or black, while those places where the skin has not been broken, retain their natural bright yellow colour. The dye is now emptied out, and the calabash dried in the sun; the whole of the outside appears perfectly smooth and shining, while the colours imparted by the above process remain indelible.

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[73] Tour of Hawaii, second edition, p. 376.

[74] This imu or oven consists of an excavation in the ground lined and generally floored also with stones. A fire is kept up in this until the stones are very hot, when the articles to be cooked are put in the place of the fire, wrapped in ki leaves, and the coals and hot stones piled about the deposit which is then covered with earth and mats and left for some time. The result, if the oven is properly timed, is excellent. New Englanders will recognize the method of their clam-bake, which was learned from the Amerind.

The huewai shown in Fig. 124 are modern, and the maker does not seem to have attained the full black dye of the older artisans. These ipu pawehe are rare in museums, and this Museum is fortunate in possessing a very full series of these decorated gourds, which were mostly the property of the alii. The black of the olden time seems durable, but the orange of the gourd is blackened in the tropical sun and also by the oil which was sure to get on them from the oiled hair and bodies of the natives. Plate XXXVI shows some of the best of the umeke pawehe, and also some of the huewai. This form of decoration is found also on the hula drums (Fig. 119, used for beating time to the dance) which were made of large specimens of Curcubita, and the resemblance to tatuing is close; the figures on the huewai in Fig. 124 are quite like the tatu patterns formerly impressed on Hawaiian limbs.

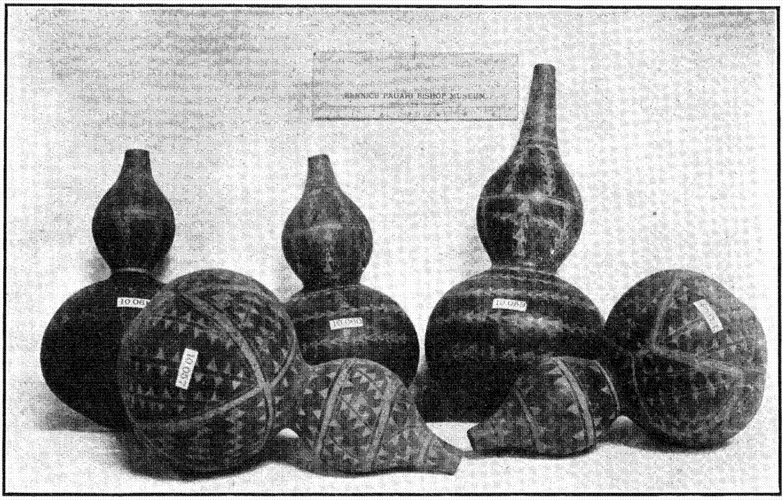

FIG. 124. HUEWAI PAWEHE.

The uses of gourds were too extensive to describe fully in a treatise on house furniture, but it may be mentioned that a form was used as an injection syringe (Fig. 125, A); the neck of a broken bottle was used as a reel for a fish-line (B); another portion in shape of a funnel was the principal implement in a game of toss (C); small gourds were filled with pebbles (D) and used as rattles (*uliuli hula*) or in the dance as castanets, and finally the fragments were used as Job used the potsherds when afflicted with furunculi. Truly the gourd was a most useful adjunct to the furnishing of a native house! The cultivation of this vegetable, once very extensive, had, in the early sixties, dwindled to a few places in Puna, Hawaii, and as many on the southerly shores of Kauai, and is now nearly extinct on this group. The Lagenaria has lasted longer than the Curcubita.

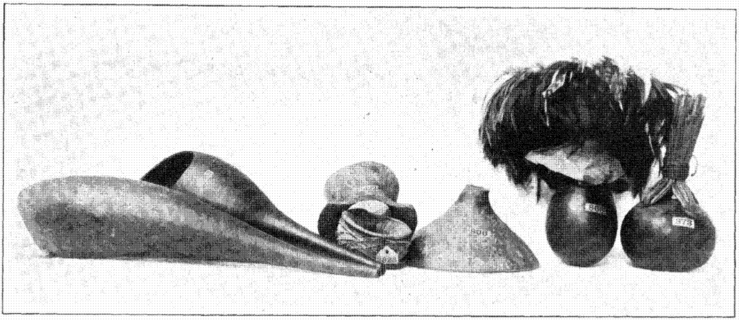

FIG. 125. GOURD IMPLEMENTS.

Coconut Utensils.—The fruit of the Coco palm has been several times referred to, and we may now examine some of the many uses this nut serves in the domestic economy of the Hawaiian. Little was peculiar to this people for the coconut is so widely spread through the tropics that many other races have exhausted their ingenuity in devising implements from the hard, durable shell of the coconut. Still it is well to show what the Hawaiians did with this material. First, probably the nuts served as water-bottles, as they still do in many parts of the Pacific, especially in the southern groups where they attain a greater size than on Hawaii. There is one in this Museum from Samoa that has capacity of ninety-two ounces or nearly three quarts. Not less ancient was their use as drinking cups, and the Hawaiians made a distinction between ordinary cups (*apu niu*) and those exclusively for the use of the priests to which the name *olo* was given. The former were cut at right angles to the vertical axis while the latter were cut parallel to this determinant: both forms are shown in Fig. 126. A coconut cup was the orthodox form for awa drinking, and such cups by long use gather a fine *patina* which is as much valued by awa experts as the rich color of a meerschaum pipe by its smoker. Although coconut cups are often

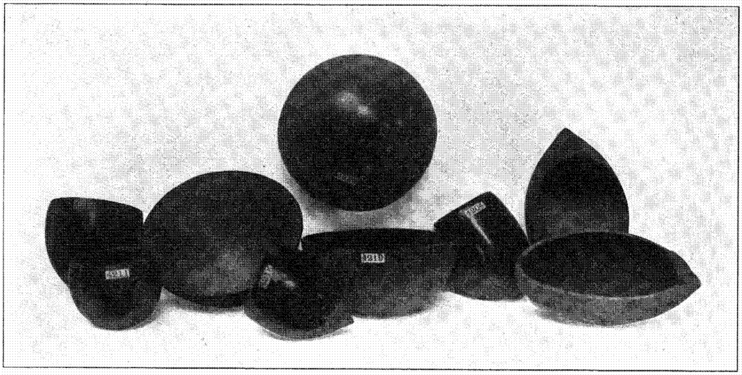

FIG. 126. COCONUT CUPS.

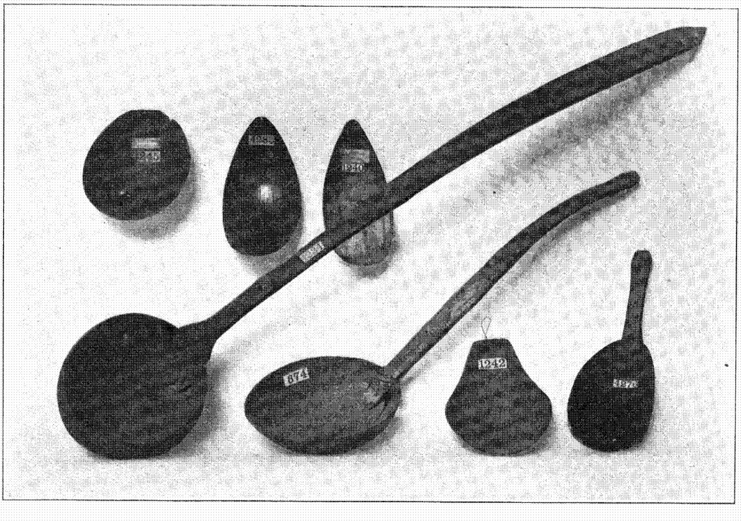
1240
674
1242

FIG. 127. COCONUT SPOONS AND LADLES.

found in the burial caves deposited with the dead, no decorated ones are known. The beautiful carving of the Marquesan, Fijian and others shown in Plate XXXVII and Fig. 128 is not found on Hawaii.

Next, perhaps, came the use of coconuts for spoons, filling a natural need, and almost any concave fragment served, but soon the handle was developed, and a very complete ladle (*ooma pu niu*) resulted. As the Hawaiians did not boil their food, and soups were unknown, this manufacture was not so important as in the groups where the discovery of pottery was followed by hot liquids. The indigenous products are shown in Fig. 127. In certain districts where the water supply was scarce and kalo could not be cultivated, the sweet potato (*uala maoli*) took its place as daily bread, but the resulting mass was wanting in the adhesive qualities of the kalo-made poi and could not be wound up on the fingers, so a spoon was needed, and the bits of coconut figured were and are still used to convey this food to the mouth. For salt cellars disks of the shell answered very well.

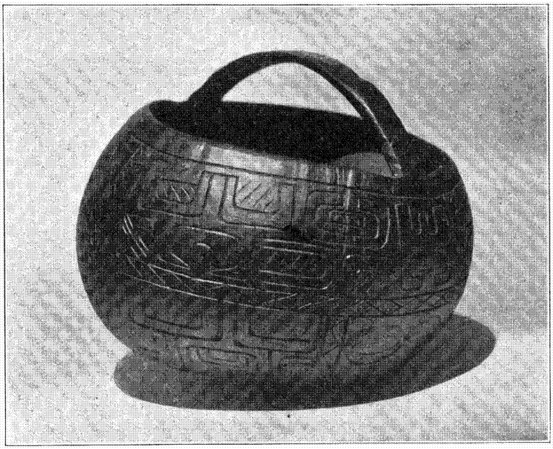

FIG. 128. MARQUESAN CARVED CUP.

As the coconut shell takes a beautiful polish the manufacture of cups, bowls and small dishes has been much modified under foreign influence. Among Hawaiians these polished nut cups, foreign even to the glue that unites the cup and base, the latter the work of the turner, are still popular for individual poi bowls at feasts. Their form is shown in Fig. 129 which presents four well made cups from the collection of the Princess Ruta Keelikolani now in this Museum. The first is one of the large southern nuts on a turned stand of kou wood; the second shows a cover and base also of the nut; the third is a well-proportioned cup and stand, and the last is one of the yellow variety of nut. Both the dark and light varieties of shell were esteemed, but the former takes the better polish; one in this Museum from the Society Islands is perhaps the most beautifully polished coconut I have seen.

Besides polishing, which is a comparatively modern fashion, the other groups furnish examples of inlaying most artistically and neatly done. The cannibals of the Solomon group have inlaid a simple coconut shell cup with crenate triangles of pearl shell in a way that would do credit to a civilized artisan who had never eaten his fellow man. The shell is hard and thin and the recesses cut for the inlay must be shallow, but the method of decoration is much used among the Solomon Islanders and they certainly understand their material (Fig. 130). On other Pacific groups much greater use was made of the coconut. How far the decoration of cups went, I cannot say, for I do not know of any collection to illustrate this, but certain specimens on hand in this Museum may be noticed. On the Fijian group a plain cup has an attachment of braided coir, so that one drinking from the cup could use this permanent napkin which could be washed with the cup (Fig. 131). On the Marquesas coconuts were often incised with the peculiar figures so much used there in tatuing and wood carving. Fig. 128 shows a cup or basket, if we consider the handle, which has a pleasing pattern surrounding the bowl. Similar to these are the Fijian carved cups and oil bottles shown in Plate XXXVII. The Papuans of New Guinea also carved their coconuts, and examples of their work are shown on the same plate. The latter coconuts seem to have a very thin shell, compared with the other nuts described.

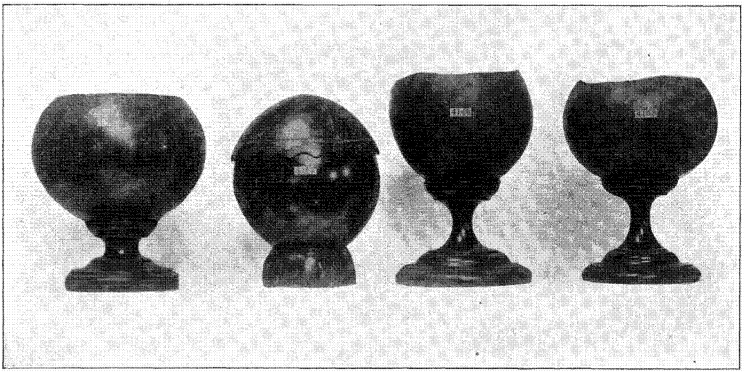

FIG. 129. MODERN COCONUT CUPS OF THE HAWAIIANS.

The Solomon Islanders had no bottle gourds and they supplied the want by an ingenious use of the coconut in which the material was completely disguised by coating the nut with a gum (*Parinarium?*), which cemented to a hole on the top a joint of bambu which was also coated with the same material. The result resembled pottery, and the nut portion was decorated with imbedded shells or beads forming patterns of great variety. Fig. 133 shows several of these bottles.

On the Micronesian groups, where coconuts are abundant and fresh water scarce, the nuts are used extensively for carrying and preserving water. The natural nut is cleaned out, the "eye" enlarged and plugged with a pandanus leaf tightly folded for a stopple and with the attachment of two cords of coconut fibre, the bottle is complete. Two are usually on the same cord, as shown in Fig. 132, for convenience of carrying. Other groups use the same contrivance, and I have found it on Samoa, Fiji and almost identical in Singapore, Akyab and western India.

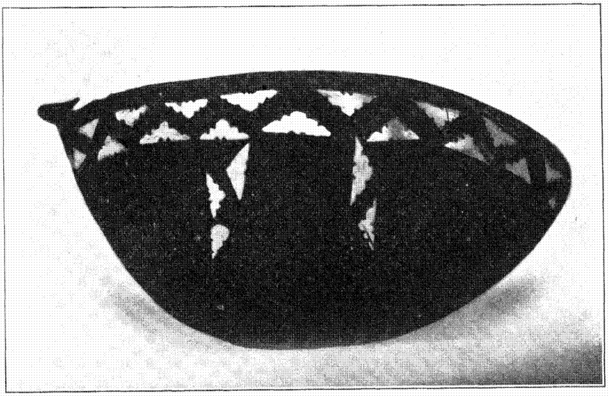

FIG. 130. SOLOMON ISLANDS CUP.

After the introduction of tobacco a small coconut shell became the favorite tobacco box (*hano baka*). A series of these in the Museum collection is shown in Fig. 134. The cups formed of the lower end of these long slender nuts were much in demand for mixing fish bait, while precisely the same thing was used in the Caroline Islands for moulding the cakes of red paint called *taik*. We must not forget that these nuts had part in the amusements of the Hawaiians, both as rattles (*uliuli hula*, Fig. 125, D) precisely as the small gourds were used, and as drums to be bound to the arms (*puniu hula*), but of these a more complete description belongs to the chapter on Amusements.

Here we may mention a pleasing custom of the Hawaiians which has survived within my own observation, for a chief to bend down a young coconut tree in token of taking possession, and ever afterwards the tree was known by the name of that chief, and on gathering the first nuts, the chief had them made into cups for presents to friends. Several such cups are in this Museum, as the cup of Pauahi, the mother of Keelikolani, that of Queen Kamamalu, and that of Liliha, Madame Boki and daughter of Hoapili: the last two cups were from the famous grove of palms at Kalapana on Hawaii.

The cups shown in Fig. 135 were such as described. Beginning on the left of the figure, No. 5016 was a cup of Pauahi, mother of Keelikolani; No. 1521 belonged to Liliha, daughter of Hoapili and wife of Boki. The next is No. 5028, an umeke kou used for poi by Queen Emma when a child. No. 1519 also belonged to Liliha; No. 5012 to Pauahi; No. 1520 to Liliha, and the last one, No. 5017, belonged to Queen Kamamalu, daughter of Kamehameha I, who with her husband Liholiho died in England in 1824.

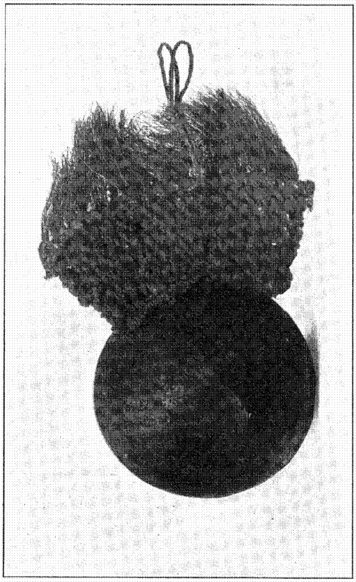

FIG. 131. FIJIAN CUP AND WIPER.

Umeke Laau.—Implements of wood were by far the most interesting as well as most numerous of all the domestic utensils in Hawaiian housekeeping, and we shall find much to surprise us and not a little to commend. From their material they were more durable than the vessels of gourd; from the labor bestowed upon them they were proportionately valued; and like the precious feather work were preserved in families, and handed down from generation to generation, until the foreigner has come to the Islands and appreciating the workmanship and grace, has tried to imitate them on the lathe, but with poor success and has ended in gathering to himself the choicest remains of this "Age of Wood", and a genuine hand-made umeke is now a rare and costly treasure; fine ones have been sold for more than five hundred dollars.

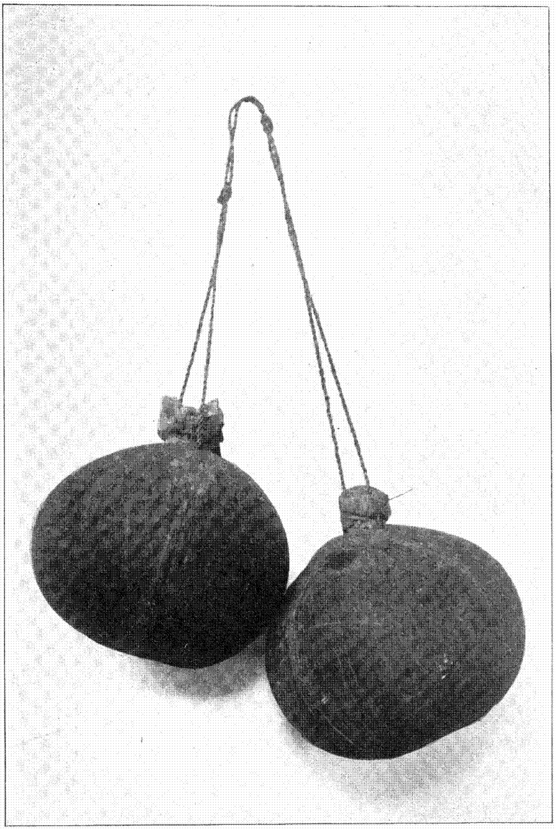

FIG. 132. MICRONESIAN WATER BOTTLES.

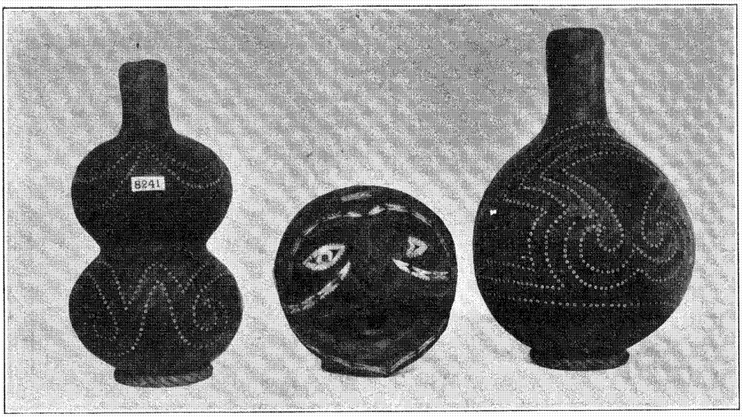

FIG. 133. SOLOMON ISLANDS COCONUT BOTTLES.

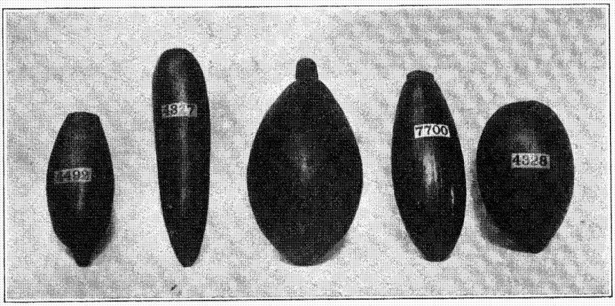

FIG. 134. COCONUT TOBACCO BOXES.

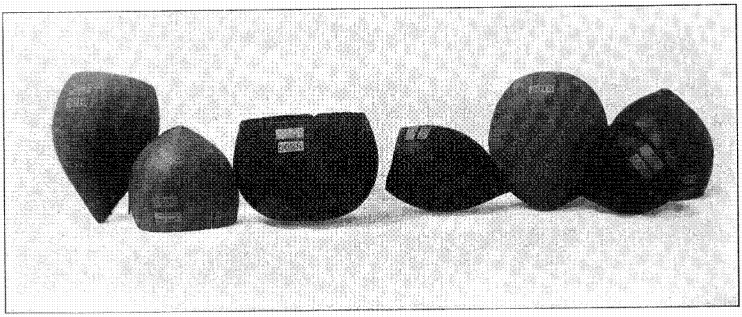

FIG. 135. COCONUT CUPS OF THE HIGH CHIEFS.

In no one thing has the artistic taste of the old Hawaiian come into closer touch with the best taste of older civilized nations than in the making of wooden bowls. Unlike the Maori, who carefully kept and honored the memory of the artists among them whose carving was good, the Hawaiian has not preserved a single name of those who patiently with stone tools fashioned the umeke, plain or grotesquely carved, that have come down to us. The Maori sculptor made astonishing relief work as we have seen in the portions of houses and figures already illustrated in these pages; his carved bowls or dishes were curious, some of them so close in motive to some of the Hawaiian dishes that I shall show later a Maori dish that closely resembles a favorite Hawaiian form; but when we look through his bowls, dishes and general household utensils we shall find nothing to compare with some of the Hawaiian umeke, and if we extend our examination through the other groups the result will be the same. Grotesque and most interesting work we shall find in New Guinea and the Solomon Islands, very original dishes on the little Matty Island, but these Papuans had pottery to make bowls and dishes which would parallel the uses of the Hawaiian umeke. The Admiralty Islanders made huge bowls, but their decorations were more striking than their shapes. The Marquesans made bowls after the general form of the Hawaiians but with none of the finish. Perhaps if we knew more of these and other groups, and had adequate collections of the work in this class that each has in the past fabricated,—for this is all past now,—our judgment might be modified; but in the absence of sufficient explora-

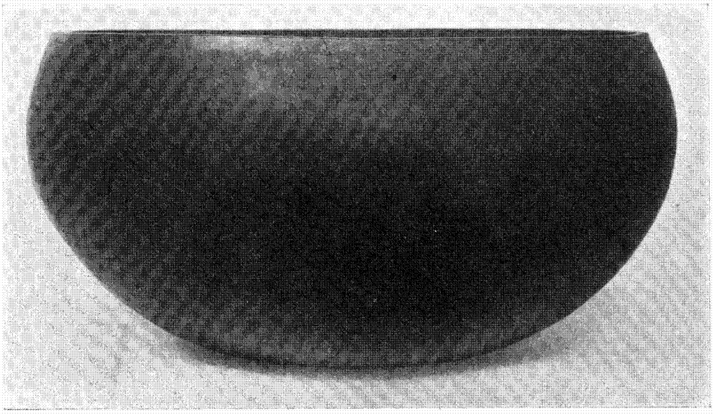

FIG. 136. UMEKE NO. 416: VERY OLD.

tion, in a few years useless, if the appointed time be not already passed, we are compelled to base our judgment on the collections in museums. From these sources, with the extensive material of the Bishop Museum at hand, and beautiful photographs of the Salem Museum, and other great collections before us, we feel justified in placing the unknown Hawaiian carver of umeke high among the departed artists of the Pacific region, and so far as illustrations go, the reader can see the quality of their work for himself. They not only excelled in form, which is unfortunately the only quality we can present to our readers in the illustration, but they worked in wood of most agreeable colors and markings and capable of a most exquisite polish: the latter quality was one not present to the old Hawaiians, who attained a fine, smooth finish in the manner to be described later, but never the glassy polish dear to many collectors of this ware, and which, although an anachronism it must be confessed displays the beautiful markings of the wood perfectly.

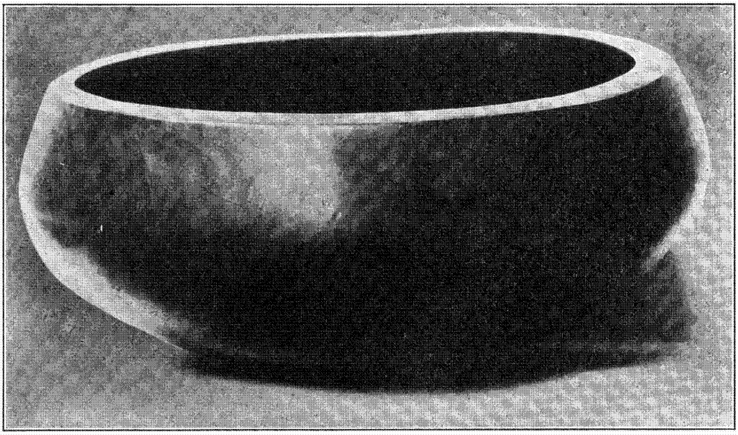

FIG. 137. UMEKE NO. 417: VERY OLD.

Among the woods most commonly used was the *kou* (*Cordia subcordata*) a littoral tree of large growth and spreading habit, found as far south of the equator as Madagascar, and formerly planted near the native houses along the beach for its grateful shade, but seldom seen now, owing to the ravages of a small moth *Azinis hilarella*=*Ethmia colorella* W. It is almost extinct on this group. The opinion of some botanists is that it has been introduced, but if so it must have been in very early time in the history of the people, as the ancient songs often mention the kou. The size the tree attains is shown by an umeke in this Museum which is nine feet in circumference, and of course made of the heartwood. To fell such a tree with a stone axehead weighing, it may be, ten pounds, must have required patience as well as muscle in the doing. Some of the oldest umeke in existence, which have been found in long ago closed burial caves are of this rather soft but durable wood.

Another tree the *Milo* (*Thespesia populnea*) has the same geographical range as the kou, the same habitat, and like the former tree is passing away and is seldom seen out of gardens, while a century ago it was planted about the houses of the alii, as is well remembered around that of Kamehameha the Great at Waikiki. Even the name is the same on the southeastern groups, where it was almost a sacred tree. It is a smaller tree than the kou, hence we have no large umekes from its wood, but there are very choice small bowls or cups. Its distinguishing feature is a rich peach color and under polish a translucent agate-like appearance.

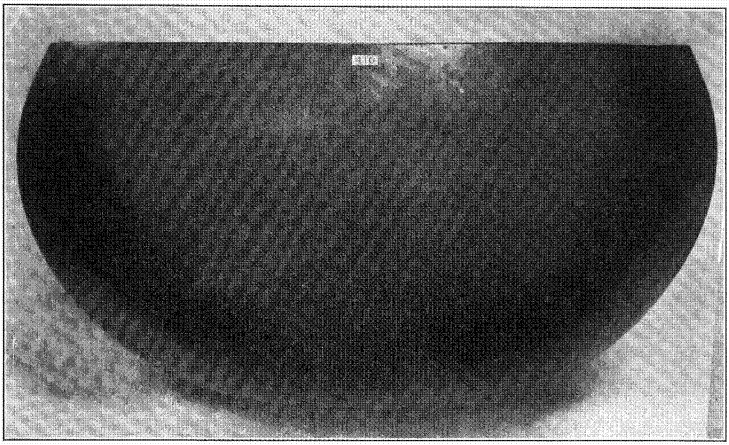

FIG. 138. UMEKE NO. 410: VERY OLD.

Another beautiful and durable wood is the *Kamani* (*Calophyllum inophyllum*), a tree found all through tropical Asia and the Polynesian islands and used on Hawaii to some extent for umekes. The tree itself is even more beautiful than its wood, and its glossy leaves and sweet-scented flowers caused the old Hawaiians to plant it near their houses while other Polynesians attached a semi-sacred character to groves of the tree, of which we find a trace in the sacred grove near the Puhonua or place of refuge at Halawa at the east end of Molokai.[75] The wood is of a brighter color than the kou.

The heart wood of the coconut was sometimes used for umeke, but those in collections of genuine old umeke would not amount to more than five per cent. of the whole number. When polished, coconut wood was very striking, but the old Hawaiians never carried their polishing far enough to bring out the full effect, and when unpolished the effect is dull in the extreme.

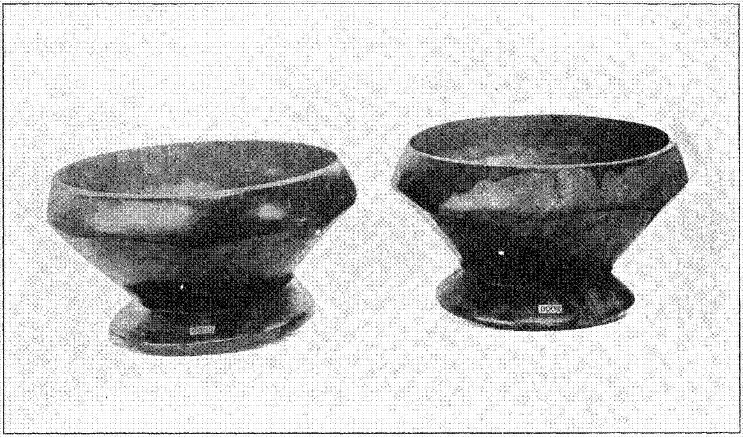

FIG. 139. UMEKE OPAKA OF KOU WOOD: NOS. 6003, 6004.

The *Neneleau* (*Rhus semialata*) is usually a small tree but at times attains a considerable diameter. In the Bishop Museum is a bowl of this wood (No. 1051) 14.5 inches in diameter. This wood is plain and close grained.

A more common material for wooden bowls of the less important sort was the *ohia* (*Metrosideros polymorpha*) of which the wood was hard and durable and much used for house building, the black variety for idols, and at the present day for railroad ties and fuel. See Plate XXXVIII for a choice umeke of this wood. In modern times the showy but coarse-grained and soft wood of the Monkey pod (*Pithecolobium siamang*) has been much used for bowls and other vessels.

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[75] Hillebrand was mistaken in stating that this grove *formerly* existed. In 1890 it was in a flourishing condition, except that it needed thinning out, and I transplanted several seedlings to my garden in Nuuanu valley in Honolulu, where they flourish and one has attained in seventeen years to a height of about thirty feet and a girth of forty-seven inches a foot above the ground.

Technique of Bowl Carving.—Although they did not always succeed, as we see from the many cracks mended in the old bowls, the Hawaiian skilled in wood working tried to season his wood thoroughly by cutting it into suitable blocks and then sinking it in some pool where it might soak for months. When a dark tone was desired, the block was sunk in the mud of a kalo patch where the ferruginous mud soon produced the appearance of age even on light colored wood fresh from the maker's hand.

When sufficiently seasoned the block was shaped outside as a solid object as may be seen in Fig. 140. We are exceedingly fortunate in having a good series of half-shaped blocks in the Museum collections. A few years ago, when Hon. Chas. R. Bishop was having some excavations made on his estate at Waikiki the laborers dug from the sand a number of such blocks, some of which are shown in the figure, so many indeed, that it was evident they had been intentionally buried. Probably at the approach of Kamehameha's hostile fleet, the artisan in bowls hurriedly buried his whole stock in the soft sand for safety: either he was killed in the fight or forgot the place of concealment, for the cache was left for another generation to study and spell out the way of working. Another specimen of a deep umeke (No. 8571), fashioned externally but only half excavated was given to the Museum by Mr. Henry G. K. Lyman: in this it is easy to see how the pecking out of the core was done.

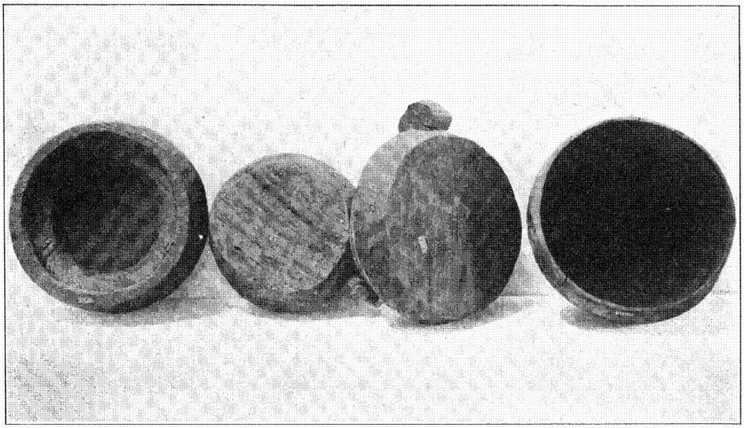
FIG. 140. BLOCKS PARTLY SHAPED PERHAPS A CENTURY AGO.

It will be at once asked by the turner of modern times how they managed to strike a circle? There are no signs of any circle struck on the flat surface, and all the specimens show, what can be seen in those figured, that the rough block was only approximately circular, and it seems certain that the final rotundity was given by the accurate eye of the artisan. Whether the result of warping or not, the accurate measurements of the genuine old umeke always detect a small deviation from the circle which can sometimes be seen by the eye. They however used for preliminary measures a flat strip of bambu which also served for a "straight edge" or rule: I have never seen one of these bambu rules graduated or marked in any definite way.

In excavating the inside it is curious to note how they adopted the method of the modern turner as shown in the first bowl in the figure, where an excavation was carried to a certain depth then an inner concentric circle was dug out in proportion to the outside curvature, and finally the angular benches were dug or grated down to the final surface. In all cases where a handle was desired a part of the block was left for that purpose, a thing the turner cannot do: he must carve his handle in a separate piece and glue or pin it on. In some of the old *ipu kuha* or spittoons found in burial caves and supposed to be of considerable antiquity this handle is of slight projection, in others has been bored for a string at some time subsequent to its original making, for the bore is rough and of inferior workmanship: these handles can be compared in the plate where many ipu kuha are photographed. (Plate XXXII.)

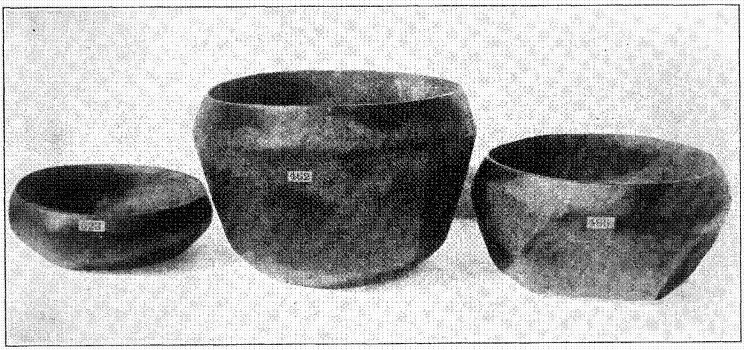

FIG. 141. OPAKA OR POLYHEDRAL UMEKE: 523–488.

In some of these half-made bowls, I think I can detect the mark of a small, sharp adze, and again the marks of a stone chisel, but the tool which seems to a modern amateur carpenter most efficient, the shark tooth cutter, does not appear to have been used on these blocks. It was, however, the favorite tool of the carver of figures.

A more difficult feat than shaping a circular bowl was making a polyhedral bowl. These are rare, and were evidently valued as they are found only in the possession of chiefs or their descendants. Those shown in Fig. 141 belonged to the Kamehameha family and from them came directly to this Museum. The sides are closely equal and beautifully finished, the flat surfaces fading into the curved ones in a most graceful manner.

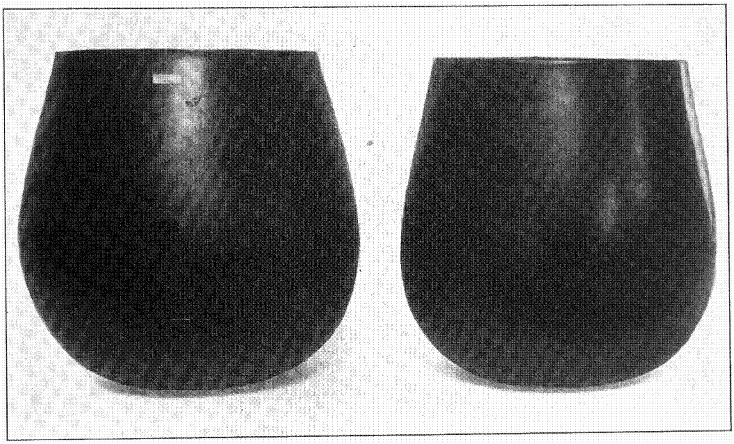

FIG. 142. DEEP UMEKE.

In size the Hawaiian umeke varied greatly as shown in Fig. 148 where the central one has a circumference of 74 inches and a height of 20 inches. The largest one in the Museum is 89.5 inches in circumference and 19.5 inches high, and natives claim that there are larger ones, but I have not seen them. A modern turner would have some trouble to handle a block of such size, and yet the old Hawaiian cut down his tree with his stone adze, shaped his block with the same implement of smaller size, and finally with stone dug out the core. In depth also they varied greatly. Some were hardly more than round platters, while others were deep in proportion to their diameter as two to one. Fig. 142 shows two of the deeper ones, the first belonging to the Museum, the other to the family of the late Chief Justice Judd. There is another much deeper, formerly in the palace, and said to be the *Ipu makani* of Laomaomao the Hawaiian Æolus, in which he kept his winds. Many of these deep umeke had thick

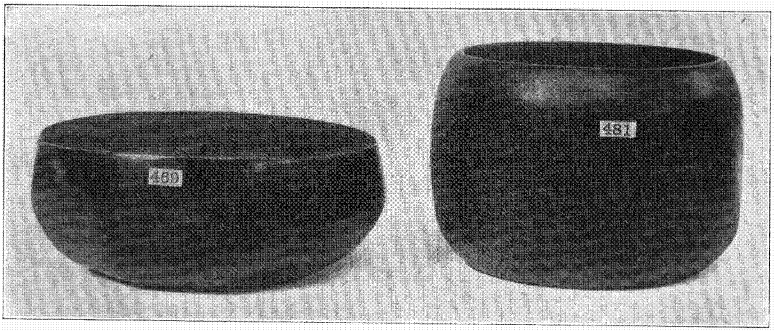

FIG. 143. UMEKE NOS. 469 AND 481.

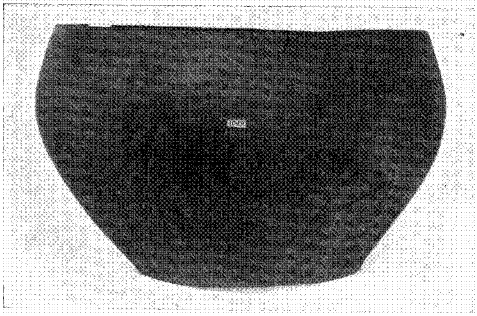

FIG. 144. UMEKE NO. 1049.

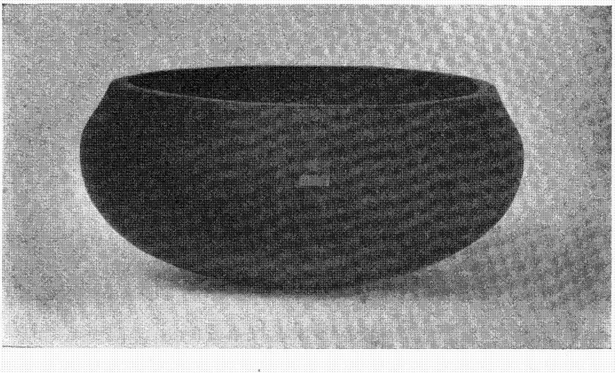

FIG. 145. UMEKE NO. 2291.

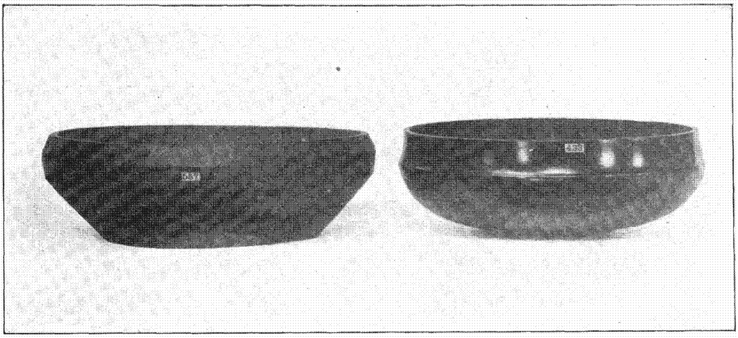

FIG. 146. UMEKE NOS. 557 AND 433.

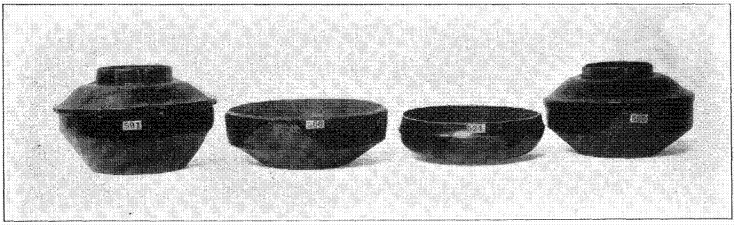
591
566
524
590

FIG. 147. MODERN TURNED UMEKE.

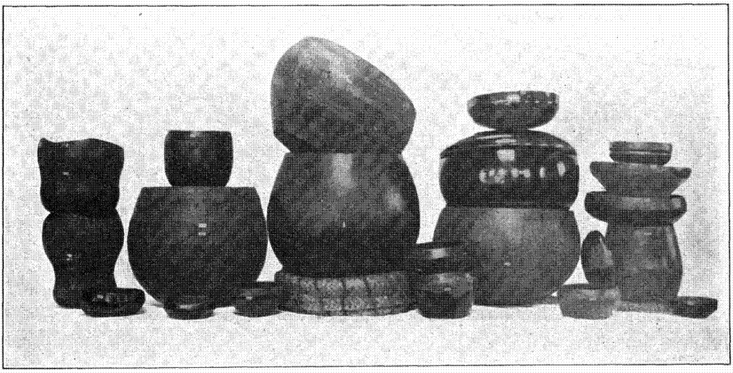

FIG. 148. COMPARATIVE SIZE AND SHAPE OF UMEKE.

bottoms and remarkably thin walls, so that if placed in a horizontal position they at once became upright and oscillated about their centre of gravity.

Anyone who has seen an Hawaiian shape a stone poi pounder with a simple pebble as shown in the first volume of these Memoirs, page 375, and has also noted the considerable variety of working or abrading stones shown in Plates XXXII–XXXV of the same volume, will have less difficulty in understanding how the native worker in wood could shape so truly and excavate so completely the bowls large and small we are now considering. Where we should saw, bore or chisel, he patiently abrades, first with a rough stone, and certain varieties of the Hawaiian cellular basaltic lava had great abrading power, then with stones of smoother grain until both the shape and surface are to his satisfaction. Time is nothing to him; seated in a cool, shady place surrounded by his selected stones and with a huewai of water and an umeke of poi, his workshop was complete. He would busily work until hungry, then a little poi and some water to prevent, as Malo says, its sticking in his throat, and then another pull at his umeke until he is weary and needs a rest, and so varying his occupation the easy going time at last brings an end to his particular work. So little does he like the monotony of any one job that he generally has several on hand, pecking a little

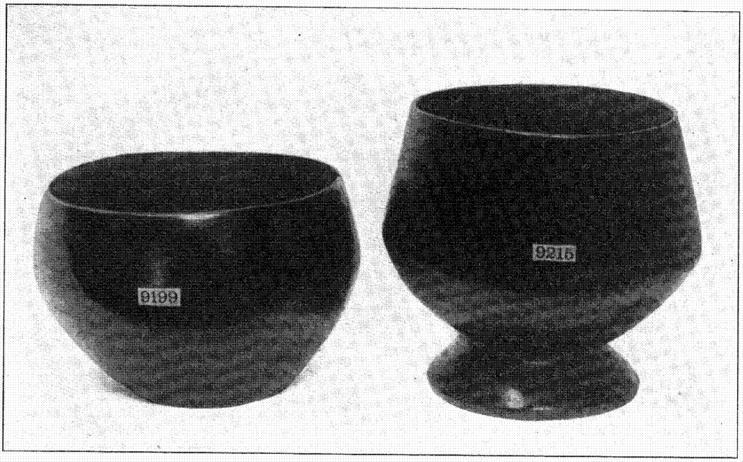

FIG. 149. UMEKE OF KOU: NOS. 9199 AND 9215.

at this and polishing a little on that, that it is really a notable event when he has finished anything. He then goes a fishing, or gives a hula to his friends.

While it is true that the outside is first finished, that does not mean that the polish is complete, but only that the form is determined and a smooth surface that is to be the final one before polishing, for from this the artisan determines the extent to which the interior is to be dug out. The interior was made beautifully smooth for cleanliness in use rather than for appearance, and when this was satisfactory the finer polish of the outside was taken in hand.

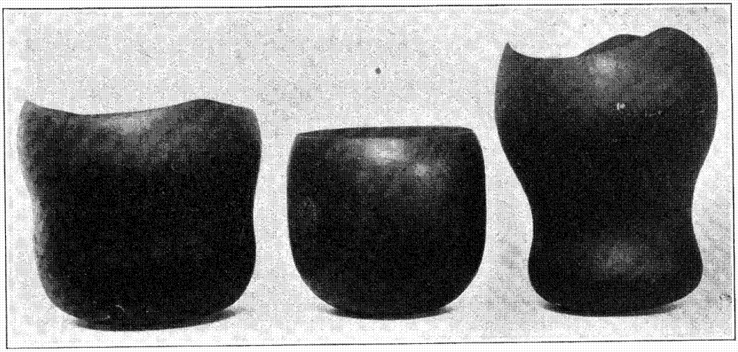

FIG. 150. UMEKE OF UNUSUAL FORM: NOS. 475, 440 AND 1143.

The order has been often stated in which the stones of various kinds were used, but there was no rule in practice that was generally followed: each man had his own way of doing his work and it would vary with the wood he was polishing. Fine coral (*puna*), *pohaku eleku* a rather soft, brittle stone, rough pumice or *ana oahi* (baked pumice), *olai*, *oio* and *lau ulu* or dried breadfruit leaves were all used in about this succession on the finest work, although *welu* of kapa smeared with ochre often followed or took the place of the breadfruit leaves. The patient application of whatever medium was the secret of the beautiful finish of the best of the old umeke.

The ancient hand-made bowls are very uncommon now, although the turner makes tolerable imitations and applies French polish in a way unknown to the old natives, but which suits the taste of modern customers. It is seldom that one sees the fine curves of the old bowls in these modern mechanical imitations, and the makers seem to recognize their shortcomings when they put in patches and make cracks only to fill them again and thus impart a flavor of antique art where the age and art are both wanting.

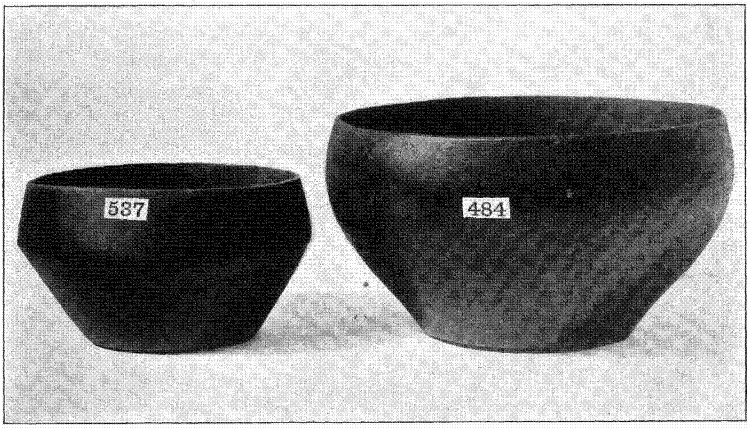

FIG. 151. UMEKE NOS. 537 AND 484.

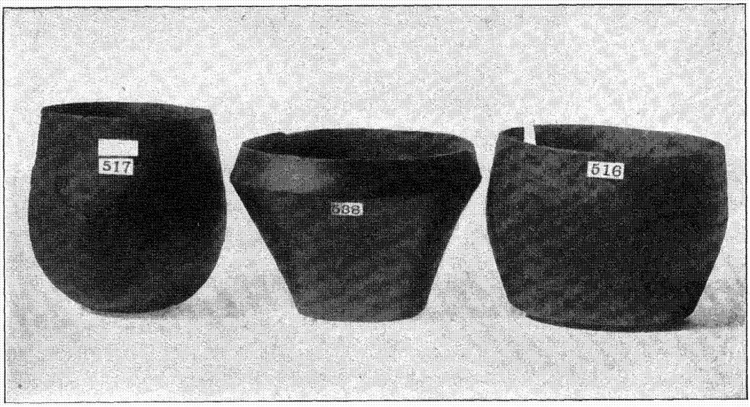

FIG. 152. UMEKE NOS. 517, 538 AND 516.

Only in large collections like those in the Bishop Museum can the choice work of the ancient artisans be studied.

We may glance briefly at some unusual forms of umeke. In Fig. 150 are shown two with the upper edge developed into three angles and a marked constriction in the waist, features that I am unable to explain. That it was not a mere freak of one workman is shown by the number of examples in this Museum apparently not all from the same hand, nor of the same age. They are well made, solid at the base, and have a fine surface.

In Plate XL we have an umeke, not in the Museum collection, with cylindrical sides and a flat bottom, the only one of this shape and size seen. While it seems old, I am inclined to consider it a modern example. The flat bottoms were not peculiar, but often occur in umeke of undoubted age as in Fig. 151, Nos. 537 and 484. Also in Fig. 152, No. 538. A partly cylindrical body but with curved upper and lower edges is seen in No. 481, Fig. 143, and also in No. 440 in Fig. 150. In the umeke with decided external angles, as No. 537, Fig. 151, and 538, Fig. 152, the inside ignores the angle and is evenly curved. In the list given below to show the sizes of the principal umeke in the Bishop Museum it will be seen that many of these, even some of large diameter are comparatively flat, as No. 445.

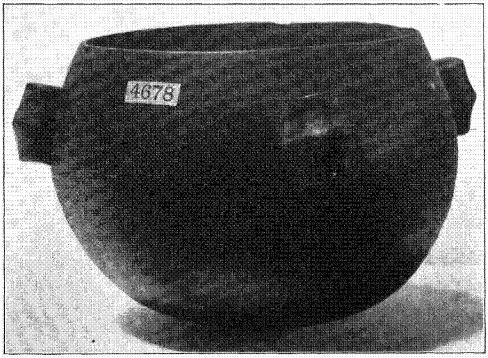

FIG. 153. UMEKE WITH LUGS FOR SUSPENSION.

I have classed with umeke the curious form shown in Fig. 153 which has four lugs remarkably well carved and bored, evidently for the cords by which the bowl was suspended, but why? It was not large enough to hold enough poi for an adult's meal, being only about six inches in diameter. It might have been a vase for the sweet-smelling flowers the Hawaiian loved, to hang from the coconut leaf-covered lanai under which a feast was held, but the inside is clean and not stained as would be probable if used as suggested. My reader must find his own use for this choice little vessel for I am unable to help him farther.

Although all the umeke figured hitherto, except in Fig. 154, have been presented uncovered, a cover was a necessary addition when used as a receptacle for poi, which was attractive to flies as well as natives, and a fly in the poi was as offensive as the proverbial fly in the apothecary's ointment. However dirty the surroundings might be, long, dirty finger nails, grimy hands, and even that rarer thing a dirty bowl into which the dirty hands freely dipped to extract the sticky poi, the most fastidious native could stomach these, but a Fly—we must get another umeke of poi! We have noted that large flat gourds were often, indeed generally used for this purpose, especially among the poorer class, the fine umeke usually had a cover made for them as shown in Fig. 154, and this cover served at a meal for a dish or plate. Often it is difficult to decide whether a round carved flat dish was such or primarily a cover for an umeke. A lot of these round dishes or *pa* are shown in Fig. 155. They cannot be considered distinctively Hawaiian as the form is found all over the world, and there

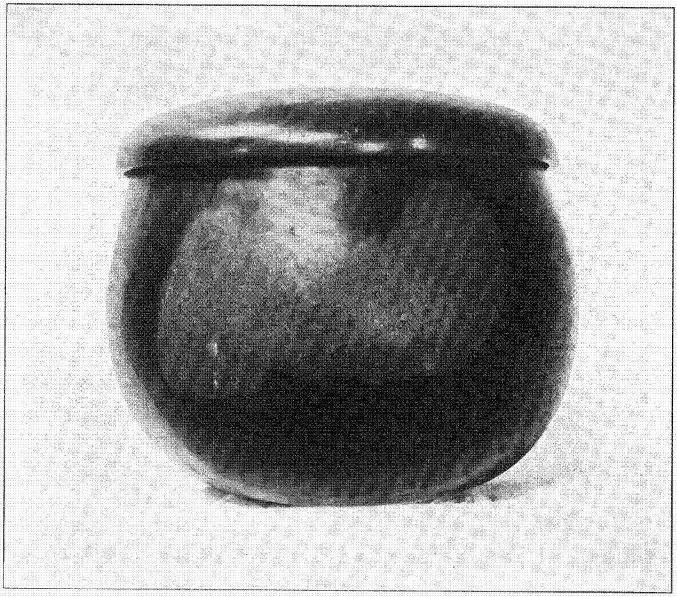

FIG. 154. UMEKE WITH COVER: NO. 420.

is hanging before me, as I write, a mahogany platter or dish that my Carib workman carved for me, entirely without my suggestion, quite like the Hawaiian ones in the figure, except for material. A convenient distinction to be noted in the pa made for covers is the raised edge to hold the cover firmly on the umeke; the smooth plate is constantly liable to slip off.

We have not exhausted the old shapes, for there are containers between the umeke poi and the flat pa, that must be noticed. The lute-shaped bowls shown in Fig. 156 are rare and exceedingly well made. I do not know to what especial use they were devoted. There is one umeke of considerable age in this Museum of the flat-bottom type, but of remarkably fine lines, Plate XL. Another class of umeke has the horizontal surface cut in flat bands: this is curious rather than ornamental, and the effect is shown in Fig. 161. Of the low umeke of great diameter I know of none so beautiful as the one shown in Plate XL. The lines are fine and the workmanship of high order; it was among the treasures of the Kamehameha family; and I wish the name of the unknown artist who designed it could be engraved upon it.

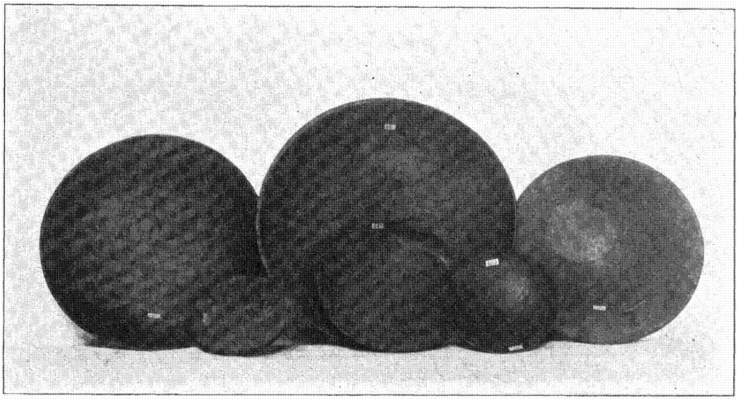

FIG. 155. HAWAIIAN PA OR DISHES.

Where the umeke pass into pa or dishes we have a strange form unlike other Hawaiian dishes both in their general shape, which is elliptical, and in having legs. These are shown in Fig. 157 and their shape is so suggestive of some of the Samoan bowls that I have placed a small Samoan *tanoa* or awa bowl, No. 2150, upon the bottom of the upturned Hawaiian dish. All the latter, however, lack the projecting handle by which the tanoa could be hung up. These large dishes (the largest in the figure is 40.5 inches long) were used for baked pig or dog; some have a depression in the rim, not definite enough to be called a spout, by which the gravy could be poured. Did the Samoan copy the Hawaiian form or was the Hawaiian the imitator? It should be stated that the usual form of the Samoan tanoa was circular, and while they usually had four legs, the number was often greatly increased; one in this Museum having a dozen legs: the polypeds are mostly modern. The Hawaiian awa bowls (*kanoa awa*) were of very simple form, sometimes hardly to be distinguished from the umeke. Two of these are shown in Fig. 158. The dimensions of the bowls with legs (Fig. 157) in the Bishop Museum are as follows:

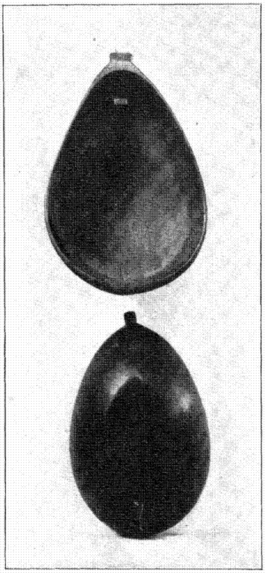
FIG. 156. LUTE-SHAPED BOWLS.

Museum No.	Diameter.	Height.	Depth Inside.
1213	24.7×17.7 in.	6.6 in.	4 in.
1214	31 ×24.5	8.5	5.3
1215	40.5×20.7	11.5	6.3[76]
1216	32.2×19.6	7.5	5.3

Next may be noticed the unusual form shown in Fig. 161, where the main bowl is divided into four compartments, and there is also an arm carrying a small bowl with only two compartments, perhaps for salt and *inamona* (relish). The main dish reminds one of the vegetable dishes common in the English restaurants made to contain several kinds of vegetable. The old dish at the side has but one shallow cell on the end projection evidently for salt.

Ipu Holowaa.—Another of the specialized forms of food bowls is that known as the *ipu holowaa* or canoe dish. As we find huewai of genuine ipu in elongated shape convenient to stow away on the Hawaiian canoe (Fig. 120), so the food dishes were sometimes of peculiar shape for the same accommodation. If we add to this the whims of royalty it will be easy to understand the odd forms of umeke shown in Fig. 159. The central umeke, No. 1355, is of fine form and in no way abnormal, but the umeke holowaa on the right, No. 1356, is unlike any other in the Museum, and it is said was used by the great Kamehameha for fish, as the previous one was for poi,

---

[76] Queen Emma collection.

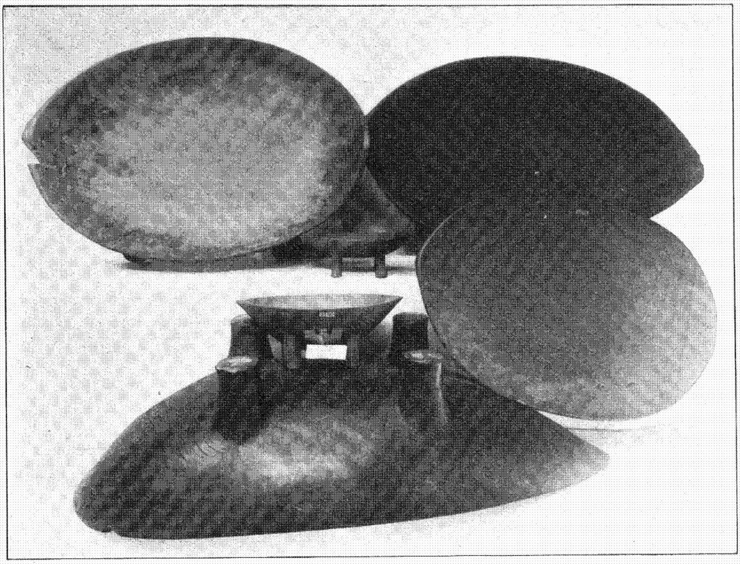

FIG. 157. LARGE HAWAIIAN DISHES.

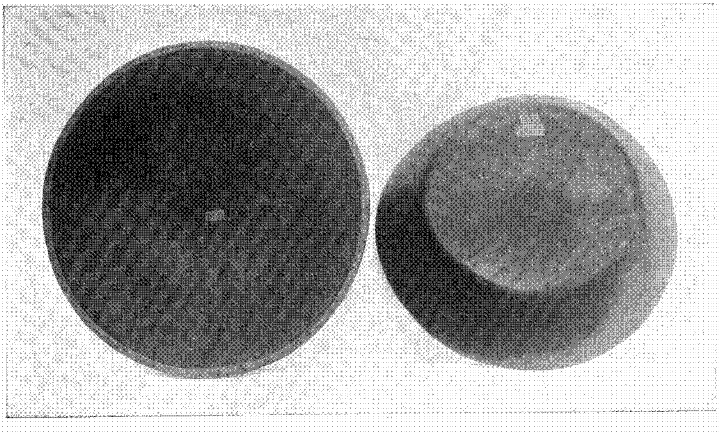

FIG. 158. KANOA AWA: AWA BOWLS.

on his canoe voyages. No. 1357 on the other side, belongs to the set and has a curious formation on the handle which renders its use uncertain. The little spittoon, No. 5009, was also a constant traveling companion of the Conqueror. The other tall umeke (No. 5010) has an even more curious history. It is made of two plates of tortoise-shell (*ea*) fastened together by a narrow strip of the same material in an ingenious and water-tight suture: the bottom is of wood to which the ea is firmly attached. The form of the rim is quite like that of the large wooden umeke in Fig. 144, whose unusual form has greatly puzzled the writer. We know that this was Kamehameha's medicine bowl, and the legend attaches to it that it measured a dose! Even of sweet water it would be a generous one, for it holds a little more than three quarts; but then the king was a mighty man. Does this suggest to us that the other umeke were the utensils of the native *kahuna lapaau* or medicine men, and used in the preparation of their remedies? We know that the old Hawaiians possessed a considerable knowledge of the healing powers of herbs, and that it was by no means their practice to administer insignificant doses. They seemed desirous of filling the patient with their remedy through either end of the alimentary canal.

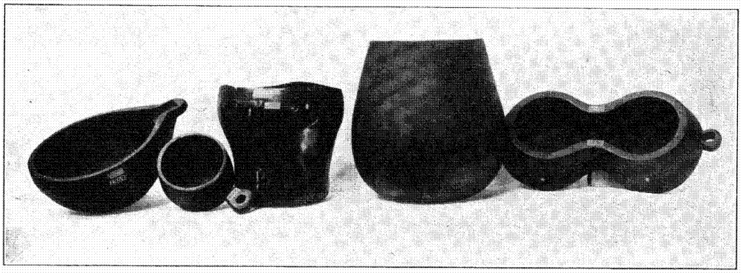

FIG. 159. UMEKE OF KAMEHAMEHA I.

The use of ea in this way may have had connection with the strong superstition that drugs were more virile if treated and used in bone cups or triturated with bone pestles. Ea was also used in Hawaii for small dishes and large combs, and the natives certainly understood the process of softening it by heat to mould it to such shapes as they required. Here should be noted the modern turned umeke shown in Fig. 147 because they are used even now in Hawaiian feasts, and sometimes find their way into collections of Hawaiian umeke as modern imitations of old forms. This they are not, and the covers which are really inverted dishes with a raised rim to serve as handle to cover or base to dish are apparently of Chinese *motif*.

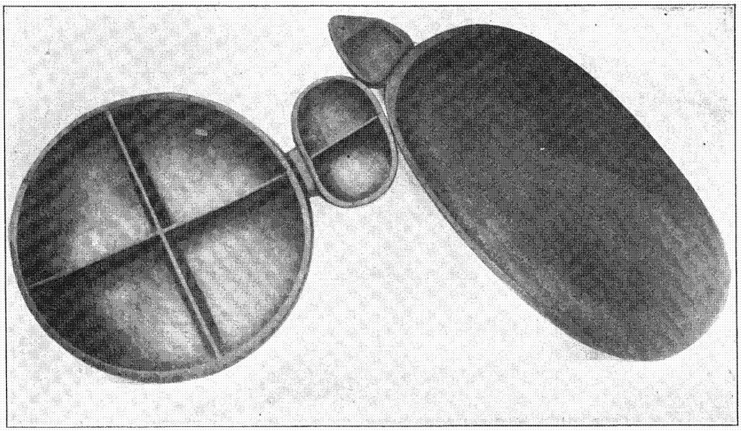

FIG. 160. DISHES WITH COMPARTMENTS.

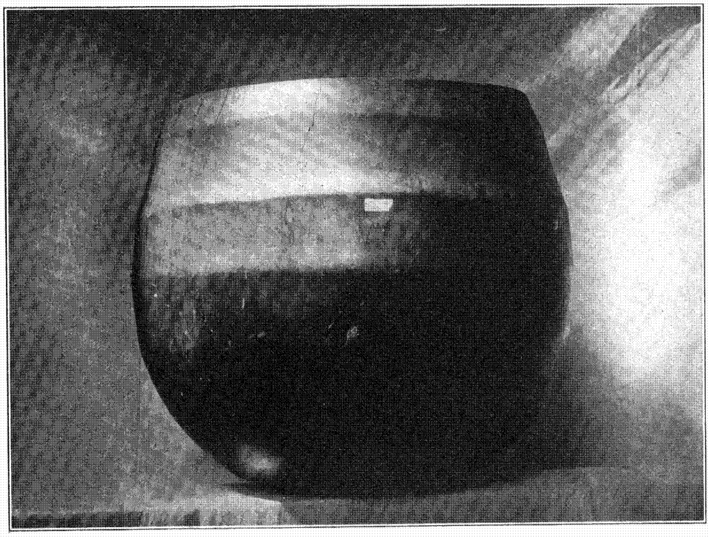

FIG. 161. UMEKE NO. 1050.

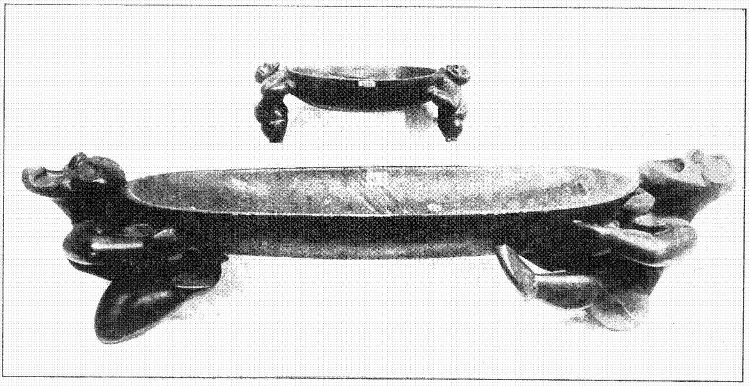

FIG. 162. CARVED HAWAIIAN DISHES.

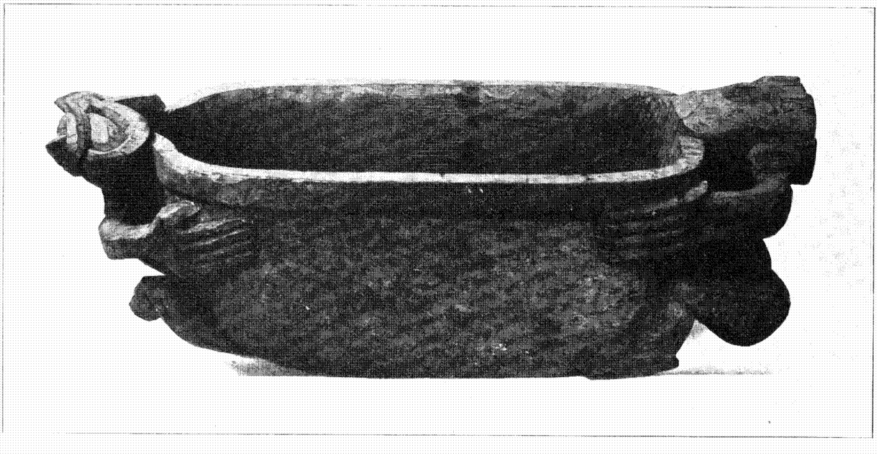

FIG. 163. MAORI DISH USED FOR CRUSHING HINAI BERRIES.

Here should come the carved dishes, once the pride of the alii, but now scattered through the museums of the world. Few indeed remain in their original home. Two are in this Museum and are shown in Fig. 162. The small one, a sauce or gravy dish, belonged to King Lunalilo, and was used during his reign as a card receiver. The other also belonged to the Kamehameha family and was the property of Princess Keelikolani. This is of sufficient size for roast dog or pig. The figures are Kahahana and Kekuapoi his wife, who, it will be noticed both face in the same direction. The mouth of each is greatly exaggerated to form convenient salt cellars. Now while bowls with human supporters are by no means rare (there are several from New Zealand with figures which might, by courtesy to the figures, be called human, in this Museum) they in most cases both face in towards the bowl, or both face out. Here the figures are facing in the same direction and some skill is shown in disposing of the legs of the leading figure. Now among the Maori articles here is a dish or trough, Fig. 163, No. 1532, where the same arrangement obtains: the leading figure here has the head of a monster through whose open gullet and mouth the liquid contents of the dish

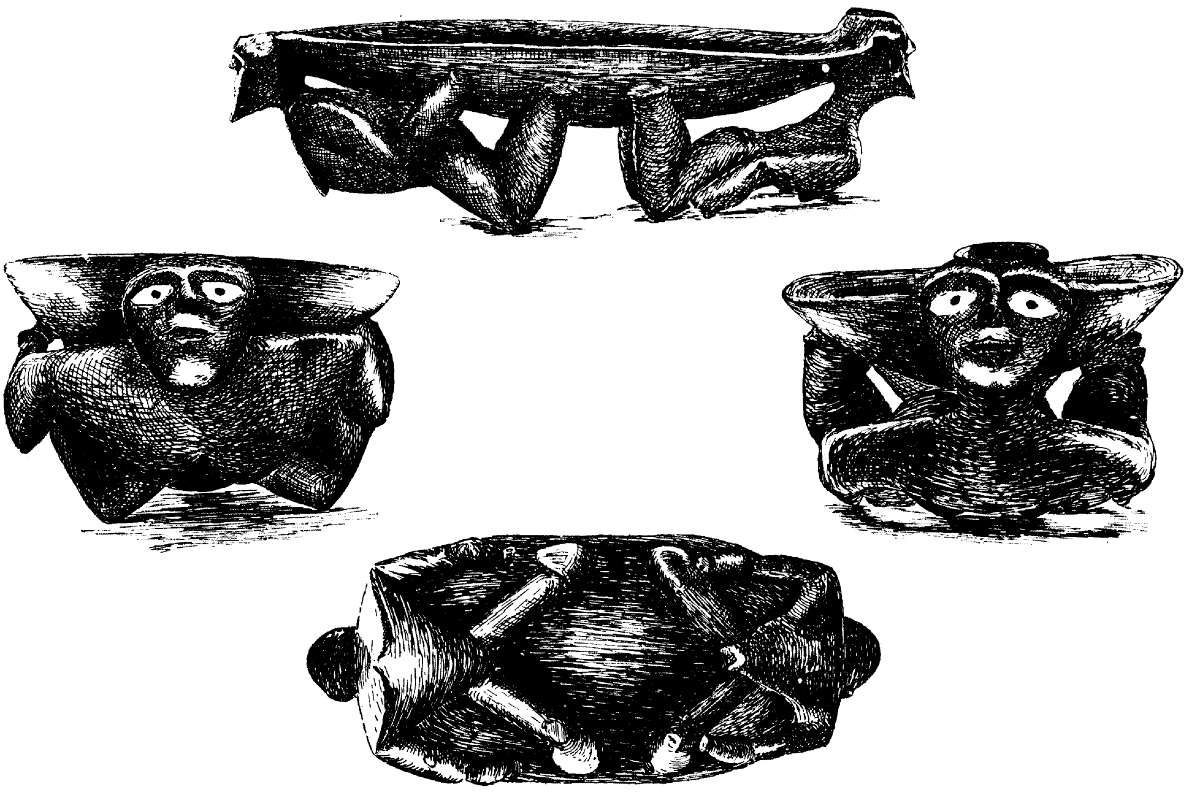

FIG. 164. HAWAIIAN CARVED DISH IN LEIDEN MUSEUM.

can be discharged: the other figure has a human head, certainly of the blockhead type. The Maori dish is rudely carved as may be seen in the illustration, and is not very old, while the Hawaiian example is of great antiquity. Plate XXXV contains most of the carved Hawaiian dishes in the European museums, and there will be seen another bowl now in the British Museum where the same one direction *motif* is used, although the figures are both standing. In a similar dish in the Leiden Museum both figures are attached to the base of the bowl and face outwards.

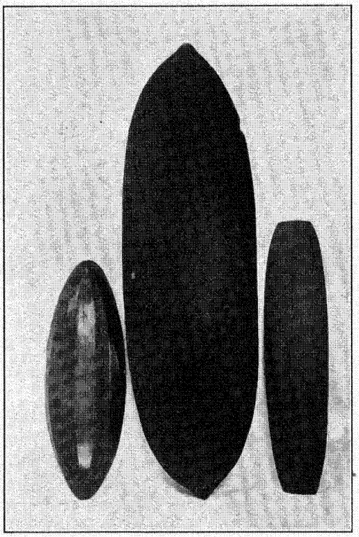

FIG. 165. LONG PLATTERS FROM THE DEVERILL COLLECTION.

The common people had none of these carved or fantastic dishes, but they certainly had a more comfortable substitute for these dishes of the alii. Very many have survived from remote times, buried in the caves where they perhaps held food for the manes of their departed owners. I do not mean to say that the upper classes did not have the very convenient dishes I am about to describe, for they certainly had all worth having that the makaainana possessed, but many of the specimens shown in Fig. 166 are of such rude art that they mark very early time or very humble owners. Some are not very different from the rudely hewn troughs used in both New and old England for feeding sheep, or a better illustration still the log troughs so common in maple sugar camps. Some are square at both ends, others rounded at both ends, and others still, square at one end and rounded at the other. Almost all have some handle or hole fitted with string by which they may be hung up out of the way. They were used for fish or baked meat, and the central one in Fig. 165 is almost long enough for the great eels of the Hawaiian waters: 44.5 inches long and 14 wide.

Before taking up the next articles of house furniture, the finger-bowls, slop basins and spittoons, we will insert a tabular view of the umeke, and allied utensils showing their material and size, and to some extent, their shape, for the Bishop Museum collection is so large, authentic, and varied that it fairly represents the best

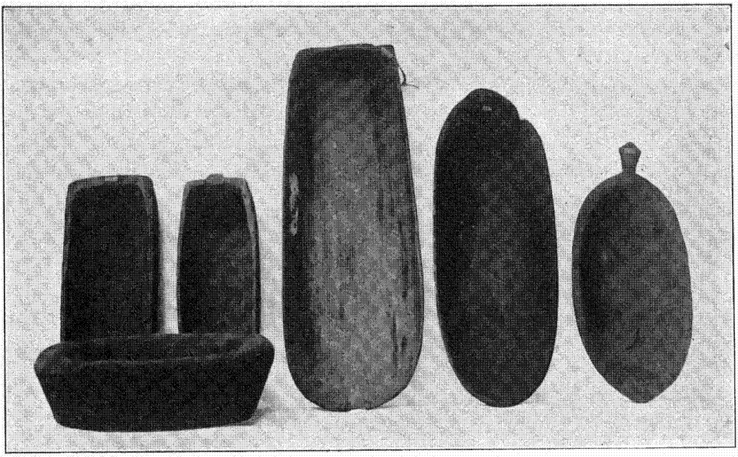

FIG. 166. LONG PLATTERS.

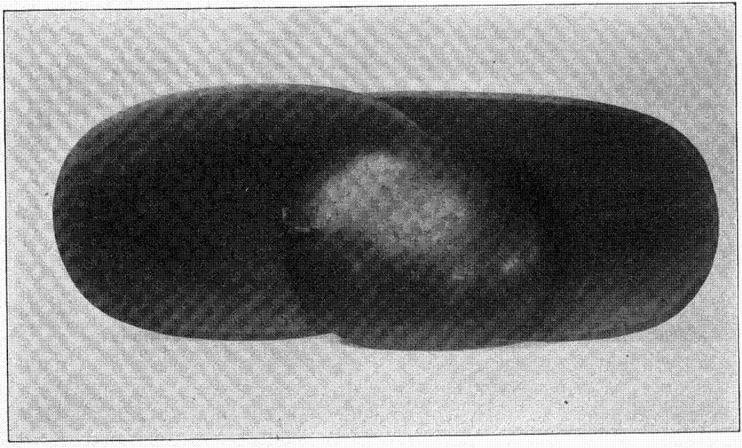

FIG. 167. BROAD PLATTERS.

of such material among the old Hawaiians. I am the more ready to do this because I found that a similar, though far less complete, list given in the first Museum catalogue now long out of print was found useful to a degree not anticipated. The measurements have been taken anew by the Curator of Polynesian Ethnology, Mr. J. F. G. Stokes, whose careful work may be relied upon. The reader not fond of statistics can easily skip the tables.

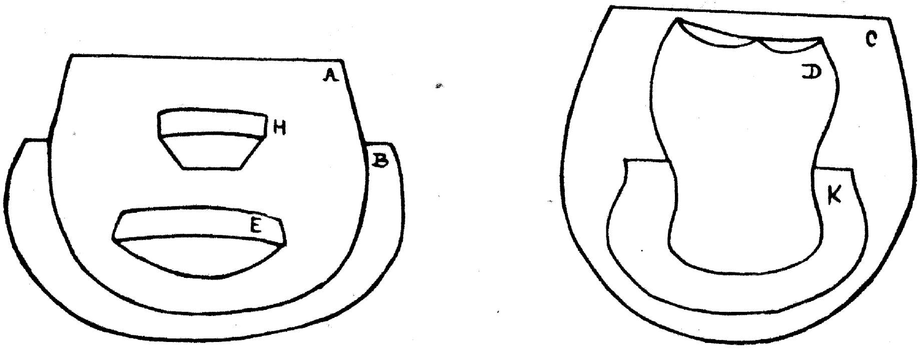

FIG. 168. OUTLINE FORMS OF TYPICAL UMEKE.

In the following table are given first the Museum number, then the material and any notes, the height, diameter and form: the latter designated by letter whose counterpart is given on the outline diagrams of the typical Hawaiian forms, Fig. 168. When the material is not given *kou* is to be understood.

UMEKE IN THE BISHOP MUSEUM.

409	Kou, old.	19.5	29.1	A
410	Queen Emma collection. Fig. 138.	13.3	26.7	B
411	Q. E. Fig. 137.	11.2	26.3	
412		20.3	23.5	A
413		15.1	23.1	A
414	Belonged to Abner Paki	9.5	24	B
415	Kamani, with cover.	10.7	22.6	B
416	Fig. 136.	9.8	22.4	B
417		17.3	22	A
418	Q. E. Flat bottom. Plate XL	6.4	22.1	
419		10.1	21.4	K
420	With cover, Fig. 154	14.3	19.2	A
421		7.5	18.8	K
422	Coconut wood.	11.7	18.7	A
423		11.6	18.4	A
424		6.9	17.2	
425	Q. E. Old.	13.7	17	A
426		12.3	16.8	B
427	With cover.	8.2	16.5	B
428	Turned.	5.2	15.4	K
429		10.8	15.4	A
430		7.8	15.1	B
431		5.9	15	B
432		5.9	14.8	K
433	Turned. Fig. 146.	5	14.5	
434	Q. E.	5.3	14.6	K
435	Old.	6.9	14.3	K
436	Kamani, turned.	4.7	13.4	K
437	Q. E.	12.3	12.9	A

438	Turned.	6	12.9	K
439		7.7	11.8	C
440	Q. E. Old, opaka. Fig. 150	9.7	10.6	
441	Kau, Hawaii.	5.7	15.6	B
442		8	14.8	K
443		6.2	16	E
444		5.8	14.3	K
445	Q. E.	4.3	13.4	E
446	Q. E.	3.7	14.1	E
447	With cover.	4.9	12.9	K
448	Old, unpolished.	6	13.3	K
449	“ “	7	12.6	K
450	“ “	7.8	18.3	B
451	“ “	4.7	11.7	K
452	“ “	4.2	11.7	E
453	“ “	10	10.9	A
454	Ohia wood, Punaluu, Kau	8.7	9.6	A
455	Old, unpolished.	4.1	10	K
456	Turned.	4.2	12.2	K
457	“	3.2	11.2	E
458	“	4	11	E
459	“	5	11	B
460	“	4.8	11.1	K
461	Melia azederach.	5	11.9	K
462	Fig. 141.	6.5	10	
463	Eleven-sided.	4.5	9.7	B
464		3.8	9.7	E
465	Plate XXXIX, 4.	6.7	8.7	A
466		3.5	10.5	E
467	Turned.	3	10.8	D
468	“	3.2	9.7	B
469	Old, decahedral. Fig. 143	3.4	9.1	
470	Unpolished.	6.7	9.7	A
471	“	7.3	9.3	A
472	Unfinished.	7.2	9	C
473	Ohia wood. Burial cave	7	7.6	
474	Kanupa cave.	6.7	8	A
475	Q. E. Old. Fig. 150.	11.7	12.6	D
476	Q. E.	7.6	10.1	A
477	Q. E.	6.6	7.4	A
478		6	7.6	C
479	Plate XXXIX, 1.	5.1	7.1	C
480	“ “ , 5.	5.9	7.4	C
481	Decahedral. Fig. 143.	5.4	7.9	
482	Plate XXXIX, 3.	7	7.7	D
483	Old, unpolished.	4.9	7.5	B
484	Fig. 151.	4.3	8.1	
485	Kanupa cave.	6.2	7.9	B
486	Old, rough.	6.8	7.1	
487	“ “	4.8	11.4	E
488	Hexahedral. Fig. 141	4.3	9.1	
489		4.1	9.3	E
490	With base, turned.	4.2	9.4	E
491		3.3	10.8	E
492		3.3	11	E
493	Rough.	3.8	10.4	B
494		2.7	10.8	E
495	Grooved.	4	9.8	B
496	Turned with base.	4	9.6	E
497		3.7	7.2	A
498	Turned.	3	8	E
499		4	8.1	H
501		4.1	7.7	H
502		4.3	8	K
503		3.4	8.3	K
505	Monkey-pod.	3.3	8.4	K
506		3.1	8.2	K
507		4.2	8.7	H
508	Turned with base.	3.1	8.9	K
509		4.2	6.4	K
510		3.1	7	K
511		2.8	7.5	K
512	Turned.	3.2	6.2	A
513		3.6	6	C
515	Q. E.	3.6	6.1	K
516	Flat bottom. Fig. 152	4.5	5.9	
517	Fig. 152.	5	5.1	
518		3.4	6.2	B

519	Flat bottom.	2.8	6.5	H
520	Turned with base.	3	6.9	B
521	Turned.	2.2	7	K
522	Turned.	2.2	7	E
523	Decahedral. Fig. 141	2.3	7.3	
524	Turned. Fig. 147.	2	7	
525		2.1	7.9	K
526	Turned.	1.6	7	E
527	"	2.4	7.1	E
528	"	2.1	7	K
529	Q. E. Turned.	2.7	7.1	E
530		2.2	6.5	E
531		2.2	5.6	B
532		2.8	5.8	B
533		2.4	5.6	E
534		2.6	5.2	B
535		2.2	5.5	K
536		1.7	5.9	B
537	Fig. 151.	3.2	5.9	H
538	Fig. 152.	4.3	6.4	
539	Q. E. Monkey-pod.	2.7	7.1	B
541	Q. E.	4.2	5	C
542	Burial cave.	5	8	B
543	Kanupa cave.	3.7	8.1	K
544	" "	4.7	9.6	K
545	Burial cave.	4	10	E
546	" "	4.6	9	K
547	" "	4.5	8.7	B
548	Hemispherical.	4.1	9.1	H
549		2.5	7.9	B
550	Hemispherical.	2.7	8.5	B
551	Hemispherical. Burial cave	2.4	9	B
552	Q. E.	4.3	1.6	E
553	Ohia, rough, thick.	3.5	11	
554	Honuapo.	4.2	11.1	
555	Kanoa awa.	4.2	13.3	B
556	" "	4.7	13.7	H
557	" " Fig. 146.	4.8	15.8	
558	" "	5.2	15.3	H
559	" "	4	10	H
560		3	9.5	H
561		3.2	9.8	H
562		2.2	9.2	H
563	Fig. 147.	2.8	9.5	
564		2.6	8.2	H
565	Kamani.	2.9	9.1	H
566	Fig. 147.	2.5	7.6	H
567		2.8	6.9	H
568		2.9	7.2	H
569		2.8	7.2	H
570		3	7.7	H
571		3	7	H
572		2.5	7.2	H
573		2.9	7.1	H
574		2.7	7.1	H
575		2.6	6.1	H
576		2.6	6.2	H
577		2.6	6.2	H
578		2.8	6.3	H
579		2.4	6.3	H
580	Fig. 147.	2.7	6.3	H
581		2.3	6.3	H
582		2.6	7.3	H
583		1.8	7	K
584		2.9	8.2	
585		2.2	9.2	H
586		2.9	7.2	H
587		3	7.2	H
588		3	7.3	H
589	Fig. 147.	2.5	7.1	
590		3	7.1	H
591	Fig. 147.	3	7.3	
592	Goblet shape, like Fig. 139	5.4	4.9	
593	Goblet shape, like Fig. 139	3.5	5.3	
594	Kamani. Goblet shape	7	7	
595	Goblet shape.	6.1	6.7	
596	" "	5.7	6.8	
597	" "	6	7.3	
598	" "	5.3	8.2	

599	Goblet shape.	5	7.4	
600	" "	4.6	7.5	
601	" "	4.6	7.2	
602	" "	4.3	7.5	
603	" "	4.6	7.3	
604	Monkey-pod. Goblet shape.......	4.6	6.2	
605	Monkey-pod. Goblet shape.......	4.6	6.1	
606	Monkey-pod.	5	5	
607	"	5	5	
608	"	4.3	5.6	
609	Goblet.	2.2	5.5	
1049	Fig. 144.	14.2	23.8	
1050	Fig. 161.	18.1	21.2	
1051	Nenelaau.	4.4	13.7	
1052	Turned.	4.5	14	H
1053	Kamani.	4	11.2	K
1054		3.8	10.1	B
1055		4.4	10.1	B
1092		8	8.5	
1143	Fig. 150.	14.6	11.8	
1355	Kamehameha I. Fig. 159.......	9.6	9.4	A
2290		8	17	K
2291	Fig. 145.	8.3	17.8	
2292		7.2	14.8	B
3898	Koaia.	3.2	9.5	E
4004		5.5	7.3	C
4005	Unfinished.	5.2	9.4	B
4006		6.1	12	K
4299		5.1	11.6	E
4678	With four lugs. Fig. 153.......	4.7	6.5	
4742	Unfinished.	6.7	12.9	B
4743	"	3.2	12.2	E
4744	"	4.4	10.8	
5010	Ea (tortoise shell). Fig. 159........	7.2	7	D
5028		3.5	5	A
5595	Unfinished.	3.8	9.4	
5596		5.3	10.2	H
5597		3	12.5	
5599	Koa or ohia.	8	7	
6003	Fig. 139.	6.4	12	
6004	Fig. 139.	6.7	11.4	
6818		3.7	6.7	K
6845		4	8.3	H
7669		5	11.1	E
7868		6.2	12.3	K
7869		6	11.2	B
7870		8.1	14	B
8126	Monkey-pod.	4.7	11.3	E
8127		4.2	10.1	K
8128		5.3	9.8	B
8571	Unfinished.	15.1	18.4	A
8636		7.8	18.8	K
8637		9.3	17	B
8638		9.3	14.9	A
8639		8	12.6	B
8640		7.2	12	B
8641		6.9	14	K
8642		6	14.5	K
8644	Milo.	7.2	10.2	
8645		6.5	10	
8646		4.6	9	K
8647	Milo, turned.	6.2	7.3	
8648	Monkey-pod, turned.	4	7	
8649	" "	3	7.1	E
8650	Milo, turned.	4.5	4.5	
8651		3.1	6.8	H
8652	Milo.	8.7	13.2	A
8654	Turned.	6.8	8.6	A
8655		4.3	10.5	
8656		4.2	9.8	
8657		3	9	
8658		5.8	12.3	K
8659		5	9.8	B
8660	Monkey-pod, turned.	5.1	11	B
8661		2.3	7.2	H
8662		2.3	7.2	H
8663		5.2	8.7	A
8664	Monkey-pod.	8.6	16.4	K
9192		5.1	8.2	H

9193		3.5	10.4	E
9194		3	11.8	E
9195		3.8	8.2	B
9196		6.3	13.7	K
9197		4.5	10.7	H
9198		2.5	5.7	E
9199	Fig. 149.	4.4	6.7	
9200		6.1	11.7	B
9201		5.2	6.3	H
9202		6.1	11.7	B
9203		4.2	6.9	B
9204		8.7	13.1	A
9205		6.1	12.2	K
9206	Goblet shape.	5	7.5	
9207		4.7	13.2	E
9208		4.5	11.1	B
9209		8.1	8.9	A
9210		5	10.5	B
9211		6.8	14.7	E
9212		4.9	13.3	E
9213		6.1	13.3	K
9214		5	12.1	E
9215	Fig. 149.	5.8	6.4	
9216		6	9.2	A
9530	Plate XXXVIII.	8	20.8	B
10,081	Hemispherical.	4.3	13.7	
10,083		9	16	B

Finger Bowls: Ipu Holoi Lima.—An article of elegance doubtless confined to the Hawaiian aristocracy,—the Alii, were the finger bowls so comfortable to the guest at a meal of greasy dog or pig, where fingers were the only forks, and not less where the food was sticky poi. It was usual after eating the meat to dip the fingers into the poi umeke and finish with the *ipu holoi lima*. In many cases the hands were also washed before meals, but this was not the case with the common people, who were, according to the missionaries who first had to suffer from their filth, dirty in the extreme.

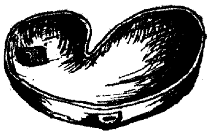

FIG. 169.

These bowls were of most varied forms as may be seen by Fig. 170 and Plate XXX, but may be divided into two general classes: one where the bowl has a single compartment for water; the other where the structure is more complicated and provides not only for water but also for leaves to serve as napkins. Of the latter class, the more uncommon one, are the three bowls in the lower half of the figure. The one at the left has one compartment for water, one for the unused leaves, and another to receive the used leaves; the one on the right has two places for water and two for leaves, while the one in the middle has one bowl for each. All three are each carved from a single piece of wood and are well finished as befits royal use. Many examples of the other and more popular class are seen in the plate and in the upper row of the figure.

One of the most curious is shown in Fig. 169, a sketch of one in the Berlin Museum für Völkerkunde. Almost as *bizarre* are the two in the centre of the plate. In most cases there is in the interior of the bowl a ridge or projection to remove the poi from between the fingers; in one, No. 610 in the Bishop Museum, this projection

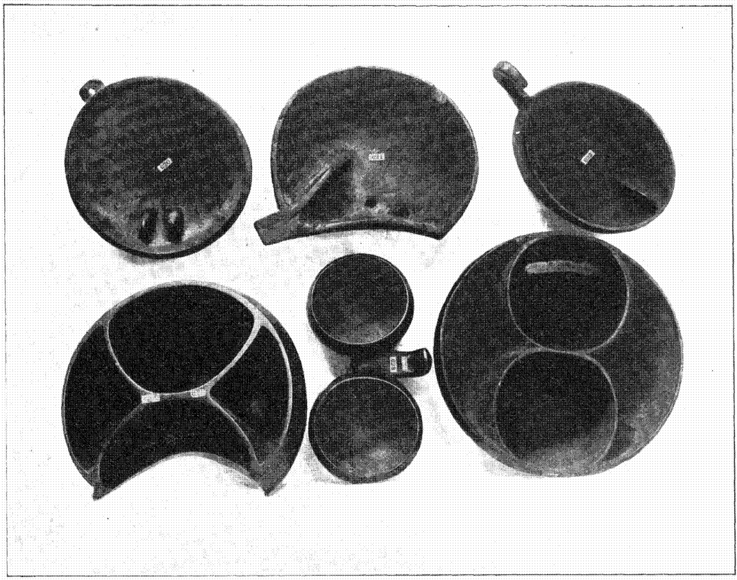

FIG. 170. IPU HOLOI LIMA OR FINGER BOWLS.

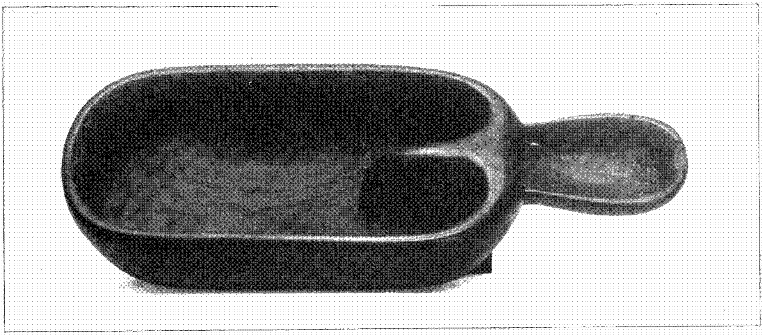

FIG. 171. FINGER BOWL WITH GRIT HOLDER.

is worn to a slender rod by long use (see the upper right hand corner specimen in Plate XXX); in No. 620 of the figure there are two of the ridges, the only specimen we have with this peculiarity. In the collection of the Hon. S. M. Damon, at Moanalua, is a finger bowl with the handle hollowed to hold sand or grit as a substitute for soap, an unique form so far as known (Fig. 171). Certainly the old Hawaiians of the upper class had attained some civilization before the coming of the missionaries!

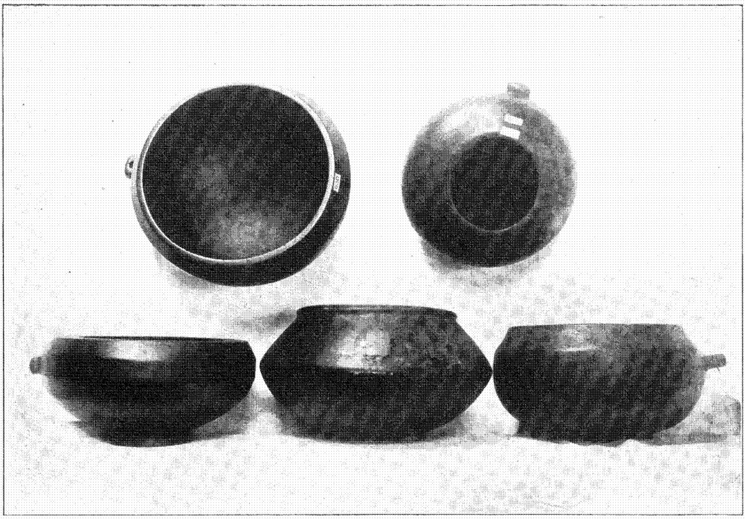

FIG. 172. IPU AINA OR SLOP BASINS.

Na Ipu Aina = Slop Basins.—An article used almost exclusively by the chiefs at their feasts to receive the refuse of their food, as fish-bones, banana skins, etc. They were thick and heavy (No. 638 weighs seven pounds) and not infrequently inlaid with the bones or the teeth of an enemy,—sometimes of many enemies, as in No. 6927 (Plate XXXI), where no less than 289 molar teeth are inserted in a bowl cut from a log of hard pine drifted to these islands from the Columbia River region. In No. 9069 many teeth are inserted and ground to show a cross section; in some of these teeth the exposed nerve cavity was so large as to require a filling, for which a splinter of another tooth was used. In No. 4144 bones were used as well as teeth and very neatly inserted.

This use of human bone for decoration has before been referred to, and it need only be repeated here that while it was deemed honorable to have one's bones in a kahili handle, in umeke, and sacred drums, it was regarded as a gross insult to the dead enemy whose solid parts were attached to spittoons or slop basins, or other "vessels of dishonor". This Museum is fortunate in having a considerable number of these fantastic mementos of perished enemies. See Plate XXXI. In some cases, as No. 9290 in the illustration, the vessel was used in sorcery and then styled *Umeke poe uhane*. The fragment shown in the plate was from the Deverill collection, and the other half is supposed to be in Kohala, Hawaii.

The following list includes also the plain slop basins: they are, with the one exception mentioned, of kou wood:

		Diameter.	Height.
630	This plain bowl is possibly an ipu holoi lima	12.5	5.5
634	Keelikolani collection, narrow base	11.5	5.7
635	Old and mended long ago	13.2	7.7
636	From Queen Emma's collection	10	5
637	Hawaiian Government; one tooth and an empty socket	9.2	4.2
639	Queen Emma collection	12.5	7
6927	Pine from Northwest Coast; weighs 7 lbs	12	6
4144	Bones and teeth; Queen Emma collection	9	4.5
9069	Cave on Hawaii; 63 teeth	10.1	5.6
9290	Deverill collection; fragment of umeke poe uhane	11.5	7

Ipu Kuha: Spittoons.—Not an agreeable adjunct to the house furniture, and yet, so far as it went, a sanitary measure that was not often found among uncivilized people. Among the Hawaiians there was a deep-rooted belief (and three generations of Christian civilization have not much weakened the belief) that the kahunas or priests had a power over the lives of men which was brought into action by the *pule anaana* or praying to death, and that not by the mere length of the prayer. This power was not confined to the priests in later days, and others might possess this sort of "evil eye", but in all cases to exercise it a portion of the intended victim must be prayed over by the sorcerer. I do not care to go into this most interesting subject here, for I shall treat it at length in another work, but in short there were persons well known to have this power in greater or less degree, and they were quite ready to exercise it for pay. The person desiring the death of an enemy secured a lock of his hair, the parings of his finger nails or his spittle: the last perhaps most easy to obtain under ordinary circumstances without exciting suspicion: hence the existence of ipu kuha. The higher the position of a man the more enemies he was likely to have, and the spittoon bearer of a chief was his most trusted attendant who received and guarded the contributions of the day, and at night washed the receptacle in the ocean if possible, if not, he carefully buried the accumulated saliva.

I have seen these ipu kuha brought into church a generation ago, and they are common enough in museums. All sorts of odd forms were chosen and the handle is often unsymmetrically placed, but is always an integral part of the block of wood from which the cup was carved. Plate XXXII shows the more important examples in the Bishop Museum. The commoners did not take such pains, as they had fewer enemies and less means to secure the services of a strong kahuna, one "powerful in prayer", and to the present day they are by no means so careful as they should be where they spit. We have no spittoons from other groups, nor do I know of their existence outside the Hawaiian group, among the Polynesians.

With Plate XXXII the following list of the principal ipu kuha and the allied ipu mimi in this Museum will give some idea of their shape and size:

IPU KUHA IN THE BISHOP MUSEUM.

		Diameter.
678		8.5
679		8.5
680	Mug shape, ring handle.	7
681		6·7
682		7·5
683	Mug shape, ring handle.	7
684	Broad, flat edge.	8
685	Ring handle.	8.7
686	Very broad edge, hook handle.	8.5
687	" " " " "	7·2
688	Broad edge, hook handle.	8.2
689	" " " "	8
690	Flat handle.	6.5
691		6.2
692	Flat handle.	6
693	Hook handle.	6.5
694	Sharp edge, impractical handle	7
695	Mug shape, hook handle.	6
696	Mug shape, flat handle.	5·2
697	Cup with hook handle.	6
698	Mug shape, hook handle.	5·5
699		4·7
700	Mug shape, flat handle.	4·5

		Diameter.
701	Oval, Queen Emma coll.	5×4·6
702	Ribbon handle.	5
703	Oval, ring handle.	7·5×5·7
704	Oval, ring handle.	7·2×4
705	Square, ring handle.	5·5
706	Square, hook handle, Q. E.	5
707	Very old, ring handle.	5·5
708	Burial cave, ring handle.	6.2
709	" " " "	6·7
3999	Mug shape, hook handle, old.	7
4000	" " burial cave.	5·5
4001	Govt. coll., broken handle.	5
4002		7·7
7515	Hook handle.	7·5
7564	Mug, flat handle.	5
7684	Mug, hook handle.	5·7
8089	Hook handle.	6.2
4003	Oval.	9·5×7·5
4143	Convex bottom, with 17 teeth and 1 socket	6·3
9222	Deverill coll., hook handle.	6·7
5009	Kamehameha's private, flat handle	4·3

Ipu Mimi.—When the spittoon was of larger size, but of the same general form as the ipu kuha it received the discharges from the distal end of the alimentary canal or from the bladder, and being made of so porous a substance as wood, it was important to cleanse it thoroughly and to expose it to the full sunlight: this custom has been faithfully continued with the crockery successor to the wooden ipu mimi, as may be noticed by the traveler at almost any native house in the country. Specimens of these vessels are shown in Plate XXXII, at the bottom. Fortunately most of these necessary but unpleasant containers were destroyed on the advent of the cheaper foreign crockery pots, and specimens are rarely if ever found in museums.

I do not believe this to have been an ancient implement, nor was it used by the common people, who were very careless about the natural excretions of the body: their *hale kiona* = privy, I do not believe existed before the contact with white men, and the term was probably made up to use in the translation of the Scriptures. *Kio* means excrement and *kiona* the fundament.[77]

IPU MIMI IN THE BISHOP MUSEUM.

		Diameter.	Height.			Diameter.	Height.
675	Kou, hook handle.	12	3.5	3997	Ring handle.	9.2	6
676	Hook handle.	9.5	3.5	3998	Hook handle.	8	3.7
677	“ “	10	3.5	3999	Broken handle.	7	4
678	Ring handle.	8.7	4	3214	Hook handle.	9.5	2.6
679	“ “	8.5	5				

Mirrors.—I have elsewhere[78] described the Hawaiian stone mirrors (*kilo pohaku*) as one of the most ingenious of savage contrivances. Malo mentions also a wooden mirror, but I have never seen one nor do I know of any that have survived in museums. With the importation of the far more efficient coated-glass mirror these native reflectors soon vanished; the wooden ones utterly, while those of stone were used as a cooling application to furunculi or other inflamed portions of the body,—they became *pohaku lapaau* in the *armamentarium chirugicum* of the Hawaiian kahuna lapaau or medicine man, and then usually had a small hole drilled near the outer edge for a suspending cord. These mirrors of stone disks, and doubtless the wooden ones likewise, had no reflecting surface when dry, and were not used, as Malo states, by merely wetting the surface, but were wholly immersed in a shallow dish of water, when, as may be seen by the experiment, a fair reflection appears when the stone is in shadow and the face well lighted.

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[77] In the early sixties I heard in the Haili church at Hilo a capital sermon in Hawaiian the text being from Deut. 23, 13. It was brought home to the simple Hawaiians by the suggestion "Consider poor pussy", and from my observations at that time, I do not doubt the congregation needed the practical sermon of the excellent missionary.

[78] Stone Implements and Stone Work of the Ancient Hawaiians. Memoirs of the Museum, vol. i, p. 398.

We have specimens (Fig. 173) of the native mounting of the foreign mirrors that Vancouver (and perhaps Cook) brought to these islands. Mere strips of looking-glass framed neatly enough in wood with a handle carved on one of the long sides of the frame. In the British Museum is a curious example of these frames, shown in the sketch (Fig. 174). On the bottom of the frame are carved two miniature tobacco pipes, while on the upper side is a tube nearly a third of the length, through which a cord was passed. The larger one in the Bishop Museum (Fig. 173) was given to Kamehameha by Vancouver and has doubtless reflected the faces of all the Hawaiian courtiers of that stirring era which witnessed the culmination of Hawaiian character. All these frames were carved in one piece; the glass was cemented in by a rather poor putty of red ochre. Very small specimens were attached to the handkerchiefs (equally foreign) of the female Alii, a parallel to the former French fashion of inserting a tiny mirror in eventails. It is not likely that this adaptation of the foreign looking-glass extended beyond the few examples used by the high chiefs, for after Vancouver's visit commerce soon brought the cheap and more convenient forms. The ancient indigenous forms must always have remained a luxury for the wealthy Hawaiians, and specimens are rare in museums.

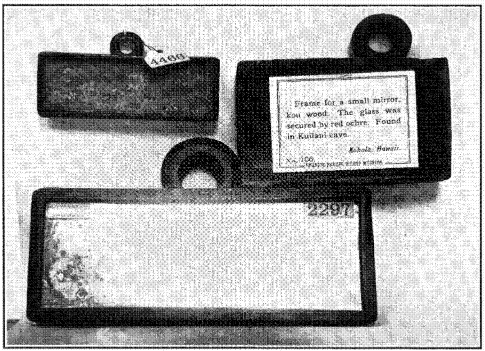
4468
Frame for a small mirror, kou wood. The glass was secured by red ochre. Found in Kuilani cave.
Kohala, Hawaii.
No. 156.
2297

FIG. 173. HAWAIIAN MIRRORS, END OF EIGHTEENTH CENTURY

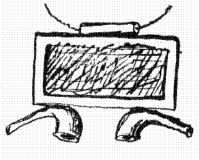

FIG. 174. HAWAIIAN MIRROR IN BRITISH MUSEUM.

Only those who have moved from a house in which they have long resided can appreciate the many little conveniences that accumulate and have been forgotten in our complicated and artificial life. To a less degree, of course, but none the less surely there will be found many forgotten things necessary to the simple life of the old Hawaiian, but which are never collected and so do not appear in museums. If we could have the sweepings of the old Hawaiian houses, so to speak, the things thrown away by their owners as unfashionable or superseded by some better invention, we should gain footnotes that would perhaps be worth more than all the text! The things that turn up in kitchen middens were refuse once but now are oracles of history, truer, if carefully read, than most that is called history.

Idle is it to lament over things we may have lost, when we shall doubtless omit to mention some of the things known to others as well as to ourselves but forgotten in the gathering of the household utensils old and new, that should find place in an old Hawaiian house of the better sort. Even when we plead guilty of passing by the stone implements, the feather-work treasures, the baskets and mats, on the plea that we have told all we know about them before, and again speak slightly about tools for kapa making which were most important things about the house; about the weapons that from the earliest times must have been the title deeds to the ownership of the house itself; of the games of which the implements were not only in the house but often so dear to the residents that they were placed together with the choicest possessions in the burial cave where the bones of the departed were hidden: because all these things are so important in themselves that they must be treated more fully by themselves than they properly could as mere furniture to a house. Whatever excuse may be brought forward, there are other things that come under none of these heads and should in any liberal plan be described with other furniture, but which may be forgotten, that it behooves us to search carefully for what may have been overlooked.

Fibres played so large a part in the economy of Hawaiian life that doubtless in most houses we should find the scrapers shown in Fig. 175, those on the left made of the pearly and hard shell of a bivalve (*Uhi kahiolona papaua*), and the rest, the far more common ones, made from the bones of the carapace of the large turtle common in these waters (*Uhi kahiolona kuahonu*). These were used not only to clean the fibres of the oloná, but also to remove the outer bark in kapa making, and even as the *strigil* of the ancients to scrape the human body. Used in so many ways they were doubtless common in and about the houses. With the scrapers went the *Laau hahi olona*, a strip of wood six to eight feet long and three to five inches wide, with one surface slightly convex and smooth. Like the scrapers these laau were used for other fibre than oloná, as waoke, mamaki, etc., so there was generally one of these stuck in the thatch somewhere about the house. The method of using is shown in Plate XV of this volume, representing a native scraping oloná for spinning net cord.

While a fisherman would doubtless have many of the implements of his calling in and about his house, such as fishing sticks, traps, nets, hooks, etc., many of the Alii were also fishermen (*e. g.*, the Kamehameha family) and kept their choicer implements in their dwellings, especially *ipu le'i* (Fig. 176), a container of fish hooks or hooks and line also; the smaller part was an umeke of wood and the cover, much larger, of gourd: some choice ones were all of gourd and of small size. The common fishing line container was a bottle gourd with a large neck capped with a small coconut shell. (Plate XXXIII.) In these the fine oloná lines were so carefully kept that it is no wonder that one would last several generations of fishermen.

The Alii had their canoes which were kept in the halau or canoe-house, but the paddles were often a part of the house furniture, not infrequently forming decorative devices with the spears which belonged to every chief. The common people often made an old canoe a part of the house itself in placing it close to the side towards the wind, the inner gunwale just under the thatch so that the drip of the rain would flow in.[79] It must be noted that some of the inland villages were apparently poorly supplied with water, as the houses on the slopes above Mahukona, Hawaii, and we know that in some cases the people brought water from springs far up the mountain. Portlock and Dixon when anchored off Waikiki in 1786 watered their ships by carriers with gourd containers filled at the upper streams (Manoa, Makiki). Captain Dixon says:

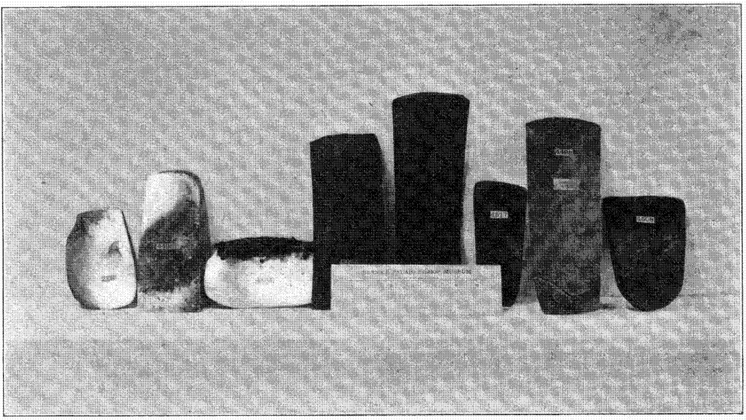

FIG. 175 UHI KAHIOLONA: SCRAPERS.

> Early in the morning of the 2d [June, 1786] our Captains went on shore in order to find a watering place, and procure accommodations for the sick: they soon met with good water, but the access to it was very difficult, occasioned by a reef of rocks which run almost the length of the bay,

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[79] To within a few years there existed at the side of the little bath-house over a steam crack near the Volcano House at Kilauea an old canoe used to catch the drip from the roof during the frequent rains. It had before that served to collect rain water at some one of the native houses formerly in the vicinity of the crater.

at a considerable distance from the shore, and so high that it was scarcely practicable, and by no means safe for a loaded boat to venture over: this circumstance made us despair of filling our water at this island; but Captain Dixon taking notice that most of the people in the canoes had several gourds or calabashes full of water, he directed us to purchase them, which we easily did for nails, buttons and such like trifles: indeed so fond were they of this traffic, that every other object was totally abandoned, and the whole Island, at least that part of it which lay next us, were employed in bringing water: for a small or a middling sized calabash, containing two or three gallons, we gave a small nail; and for larger ones in proportion. Thus in this very singular, and I may venture to say, unprecidented manner, were both ships compleatly supplied with water, not only at a trivial expence, but also saving our boats, casks, and tackling, and preserving the people from wet, and the danger of catching cold.[80]

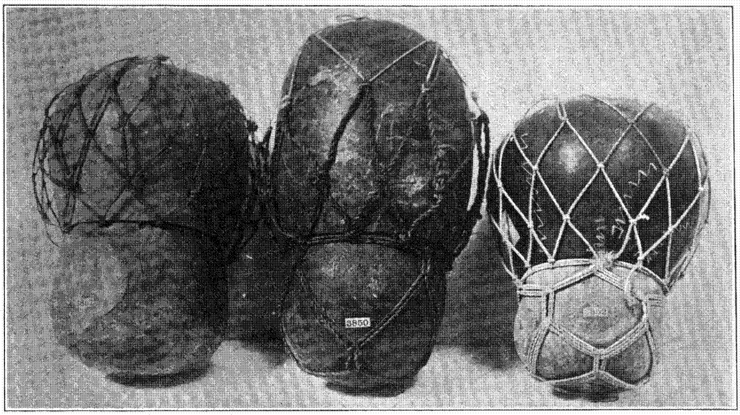

FIG. 176. IPU LE'I FOR FISH HOOKS AND LINES.

In Puna, where springs are scarce and streams unknown, large ipu are placed in lava caves to catch the drip through the porous lava roof. This was common practice all through the lava region and many a thirsty traveler has quenched his thirst at such reservoirs.

Rats and mice troubled the ancient as they do modern dwellers on these islands. Menzies and his party from Vancouver's ships, who ascended Hualalai on Hawaii, were greatly annoyed by these rodents in the hut where they passed a night in the mountain region. To reduce the number the Hawaiian used a small bow and very light arrow, such as shown in Fig. 177. How early they invented the bow and arrow we do not know, but they do not seem to have made great use of this weapon in war.

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[80] A Voyage round the World; but more particularly to the North-west coast of America; performed in 1785, 1786, 1787, and 1788 in the King George and Queen Charlotte, Captains Portlock and Dixon. By Captain George Dixon. London, 1789. p. 52.

Probably its use was confined to "rats and mice and such small deer", but it was probably to be found in most respectable houses.

Kahili = Brooms.—Another necessary thing in every house, whether the hut of the makaainana or the large house of the Alii, was a *kahili* or broom, which is also shown in the same figure. This was in no way like the splendid ornament of feathers which bears the same name and has been described and figured in the first volume of these Memoirs, but was simple in the extreme, and its simplicity doubtless suggested its use wherever the coco palm grows. A handful of the dried midribs of the leaflets of the coco palm leaf, either held loosely or tied together at the base (as was most common in Micronesia), made a practical broom convenient enough when the user could squat as the Pacific islanders do, the kahili being held almost horizontally. An old woman sweeping a garden path in this way always attracted the attention of a stranger. The remaining object in the figure is a small wooden hook to be fastened to the aho within the house: on this the koko holding umeke or huewai could be suspended, or indeed anything else hung up out of the way.

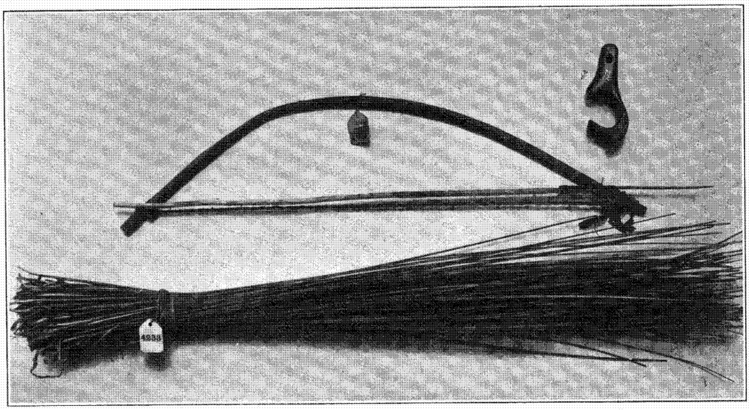

FIG. 177. HAWAIIAN BOW AND ARROW AND BROOM.

Noho or Stool.—Although the Hawaiians used neither stools nor chairs for resting but preferred the matted floor where they could recline at ease,[81] the chiefs on occasions of ceremony sat on low stools. These were carved from a single block (*monoxylon*) and were perhaps borrowed from Tahiti or other southern islands whither the adventurous Hawaiians are known to have sailed in ancient times. One of these Hawaiian stools is shown in Fig. 8 (which is repeated here for convenience of reference). It is on the right, a well cut but unornamented block of ohia wood; heavy and solid, it resembles a Samoan tanoa unexcavated. It is 18.7×17.2 inches on top and 9 inches high. On the left of the figure is an ancient stool once the property of a chief of Anaa in the Paumotu Archipelago; on the top of the first is a stool from the Marquesas used by the copra graters as indicated by the projection (which is an integral part of the stool), armed with a piece of rough coral for grating. Many of the European and American museums have Tahitian stools of light and graceful form, but the pattern is in all cases the same, and all are, I believe, monoxylon. The Hawaiian stools are very rare and the present specimen (B. M. 4345) is the only one I have seen. A more fantastic stool is in the British Museum; it represents a female figure, not unlike those figured in the second Memoir of this volume: she is on all fours, the head raised and the legs trailing. This is shown on Plate XXXV (D).

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[81] I have seen an aged Hawaiian woman, evidently very uncomfortable on her pew seat at church, gradually slide down to the floor where her satisfied look proclaimed her greater comfort.

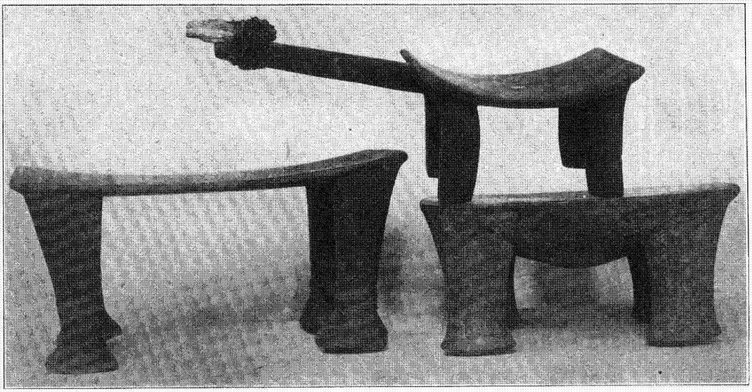

FIG. 178. POLYNESIAN STOOLS.

Omitting the last carved example, all the stools from the Polynesian groups are of one general pattern, and enough alike to suggest a common origin. The curved seat reminds one of the Central American *metate* or grinding stones, beautifully carved examples of which have been figured by Dr. Hartmann from Porto Rico. Some of these are light enough to be a petrifaction of the best Polynesian forms, except that they have generally three instead of four legs; four legs, however, sometimes occur on the American metate.

As we leave the Hawaiian house after taking an inventory of its contents, we shall probably see what we did not notice on entering, a rectangular flat stone lying so low on the stone kahua that one may be pardoned for thinking it a part of the house foundation, but a closer examination shows that its surface is marked with shallow pits in regular order and of considerable number. This is the *papamu*, a sort of checker board on which the game of *konane* was played, a game popular from ancient times all over the group, but especially on Hawaii, and it was common enough forty years ago to see two natives sitting on the stone platform near the house door intently playing this interesting game which somewhat resembled the Japanese game of gobang. The late King Kalakaua and his Queen Kapiolani were experts at konane, and it is well known that the goddess Pele did not refuse to play the game with the demigod Kamapuaa.

We have now filled the phantom house of the perished past with so much furniture that even the long house of the New Guinea Papuans would hardly contain it all, but surely any reader who has come with me thus far should be able to select such things as are needful for a primitive family even of an Alii. Unfortunately it is far easier to assemble the utensils than to call back the forms that once made and used them! The makaainana certainly lived a sordid life, without possessions, almost without rights, their gods less merciful, if possible, than their human masters the Alii, and yet they were never a gloomy or despairing people. Hard work they had, but many a game, and even the sports that none but the chiefs might take an active part in, they could and did enjoy as spectators. They were like children, and if their joyous moments were short in our view, their sorrows were equally short-lived, and the people who had a large-hearted chief had much reason to enjoy life and little to complain of.

With the Alii life must have been strenuous at times, for we know that war and devastating war was the rule for long periods before the conquest of the petty kingdoms into which the group and even the different islands were divided. There are those that claim that bloodshed developes the powers of a nation, and they point to the undoubted fact that the Hawaiians reached their highest development as a people after a long series of bloody wars, and that since peace has been established over the group, and one form and another of the Christian religion impressed upon the people, the chiefs, whose occupation seemed to have been taken from them, have disappeared wholly from the earth, and their people has ceased to be a nation and is fast following the chiefs.

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